



Command and Control Centre including Video Conference, CCTV Surveillance & Monitoring of Vehicular Congestion on National Highway Toll Plazas

Request for Proposal (RFP)



**RFP No. NHAI/13051/01/2017-IT
(Revised)
National Highways Authority of India
G-5&6, Sector-10, Dwarka, New Delhi-
110075
21-June-2017**



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The information contained in this RFP document (the “RFP document”) or subsequently provided to Bidder(s), whether verbally or in documentary or any other form by or on behalf of NHAI or any of its employees or advisors, is provided to Bidder(s) on the terms and conditions set out in this RFP document and such other terms and conditions subject to which such information is provided.

This RFP document is not an agreement and is neither an offer nor invitation by NHAI to the prospective Bidders or any other person. The purpose of this RFP document is to provide interested parties with information that may be useful to them in making their technical/ financial offers (“Bid(s)”) pursuant to this RFP document. This RFP document includes statements, which reflect various assumptions and assessments arrived at by NHAI in relation to the Project. Such assumptions, assessments, and statements do not purport to contain all the information that each Bidder may require. This RFP document may not be appropriate for all persons, and it is not possible for NHAI, its employees or advisors to consider the investment objectives, financial situation, and particular needs of each party who reads or uses this RFP document. The assumptions, assessments, statements and information contained in this RFP document, may not be complete, accurate, adequate or correct. Each Bidder should, therefore, conduct its own investigations and analysis and should check the accuracy, adequacy, correctness, reliability, and completeness of the assumptions, assessments, statements, and information contained in this RFP document and obtain independent advice from appropriate sources.

Information provided in this RFP document to the Bidder(s) is on a wide range of matters, some of which may depend upon interpretation of law. The information given is not intended to be an exhaustive account of statutory requirements and should not be regarded as a complete or authoritative statement of law. NHAI accepts no responsibility for the accuracy or otherwise for any interpretation or opinion on law expressed herein.

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NHAI also accepts no liability of any nature whether resulting from negligence or otherwise howsoever caused arising from reliance of any Bidder upon the statements contained in this RFP document. NHAI may in its absolute discretion, but without being under any obligation to do so, update, amend, or supplement the information, assessment or assumptions contained in this RFP document.

The issue of this RFP document does not imply that NHAI is bound to select a Bidder or to appoint the Successful Bidder for the Project and NHAI reserves the right to reject all or any of the Bidders or Bids without assigning any reason whatsoever.

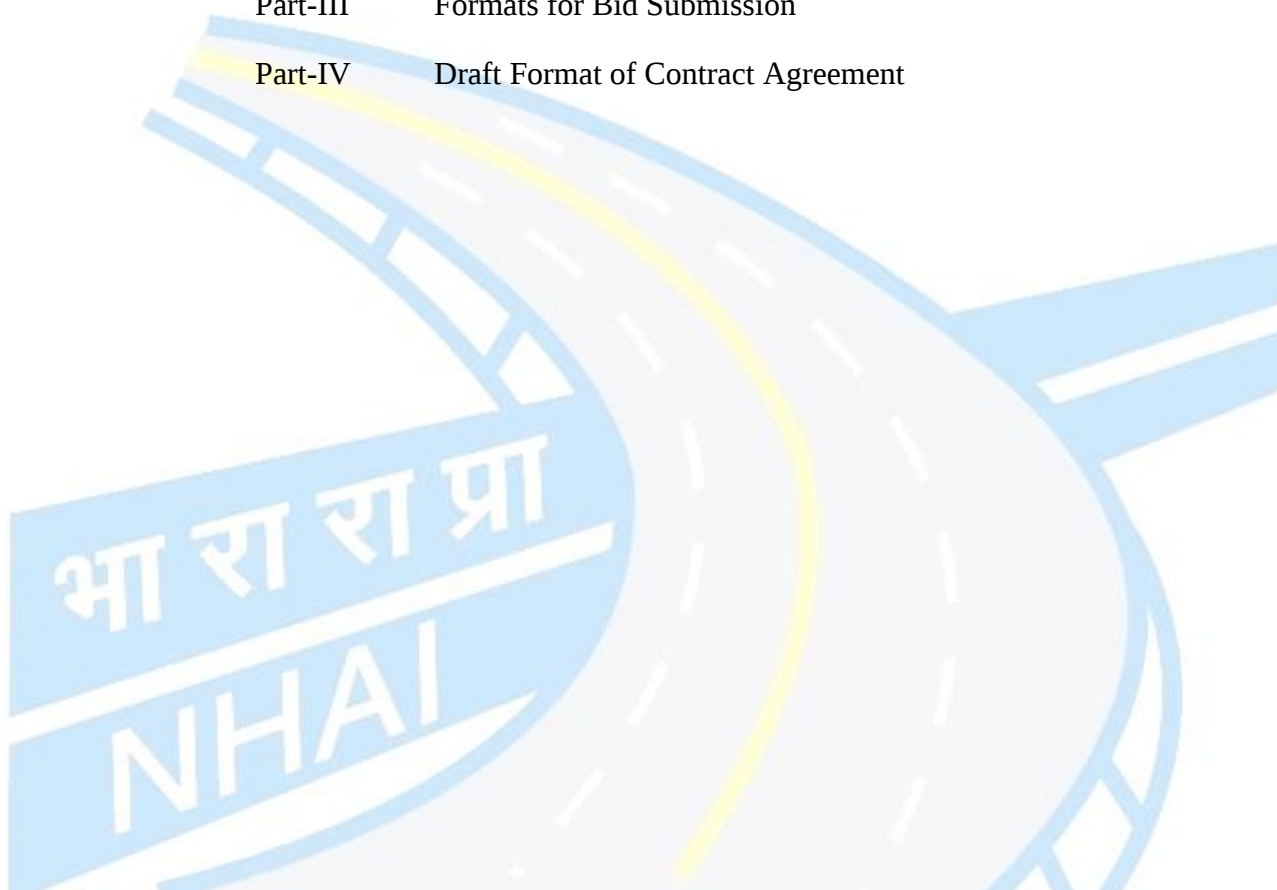
The Bidder shall bear all their costs associated with or relating to the preparation and submission of their Bid including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by NHAI or any other costs incurred in connection with or relating to Bid. All such costs and expenses will remain with the Bidder and NHAI shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by a Bidder in preparation or submission of the Bid, regardless of the conduct or outcome of the bidding process.



Document Composition

This RFP Documents comprises for following parts.

- | | |
|----------|------------------------------------|
| Part-I | Instructions to Bidders |
| Part-II | Terms of Reference |
| Part-III | Formats for Bid Submission |
| Part-IV | Draft Format of Contract Agreement |

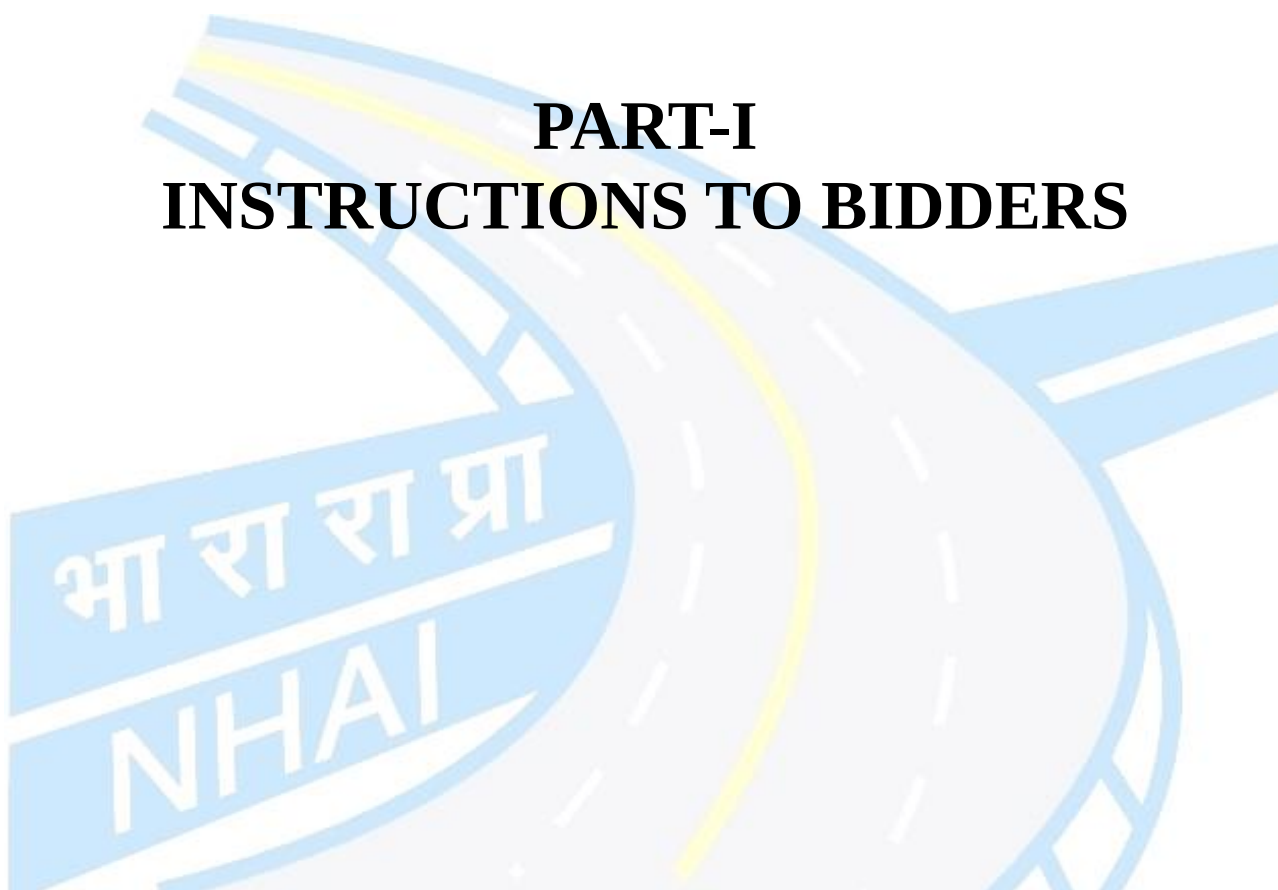


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PART-I INSTRUCTIONS TO BIDDERS



**NOTICE INVITING TENDER**

(National Competitive Bidding through e-Tendering mode only)
RFP No. NHAI/13051/01/2017-IT (Revised) dated 21/06/2017

National Highways Authority of India (Hereinafter referred to as “Authority” or “NHAI”) intends to engage a Service Provider for Design, Supply, Installation, Testing, Commissioning, Configuration, System Integration, Operations and Maintenance of Command and Control Centre including Video Conferencing, Comprehensive CCTV Surveillance & Monitoring of Vehicular Congestion on Toll Plaza along the NHs and Video based ATCC.

Brief particulars of the Project are as follows:

Name of the Project	Indicative Project Cost (In INR Cr.)	Indicative Operation and Maintenance Expenses <u>Per Annum</u> (In INR Cr.)
Command and Control Centre including Video Conference, CCTV Surveillance & Monitoring of Vehicular Congestion on National Highway Toll Plazas	77.28	27.86

Note: However, the assessment of actual project cost and operation and maintenance expenses, will have to be made by the Bidders.

2. Pre-bid meeting was held on 05/05/2017 at NHAI HQ. based on queries received and modified requirements of NHAI, this Revised RFP document dated 21/06/2017 is issued herewith, which will supersede the existing RFP document of even number dated 12/04/2017.

3. The project shall be a complete turnkey solution with provision of skilled resources at all locations for operations and shall be offered to NHAI as “**Infrastructure as service model**” The period of engagement shall initially be **six years inclusive of project implementation period**. This may be extended, at the sole discretion of NHAI, for another two years subject to satisfactory services and continued requirement of NHAI.

4. The prospective bidders are hereby invited to submit their bids comprising Technical and Financial Bids through e-tendering mode only by the bid due date. Bid shall be valid for 120 days w.e.f. bid due date. The bids should be submitted online only on e-tender portal of NHAI and in the prescribed formats. No change in the formats and / or other mode of bid submission is permissible.

**SCHEDULE OF IMPORTANT EVENTS / ACTIVITIES**

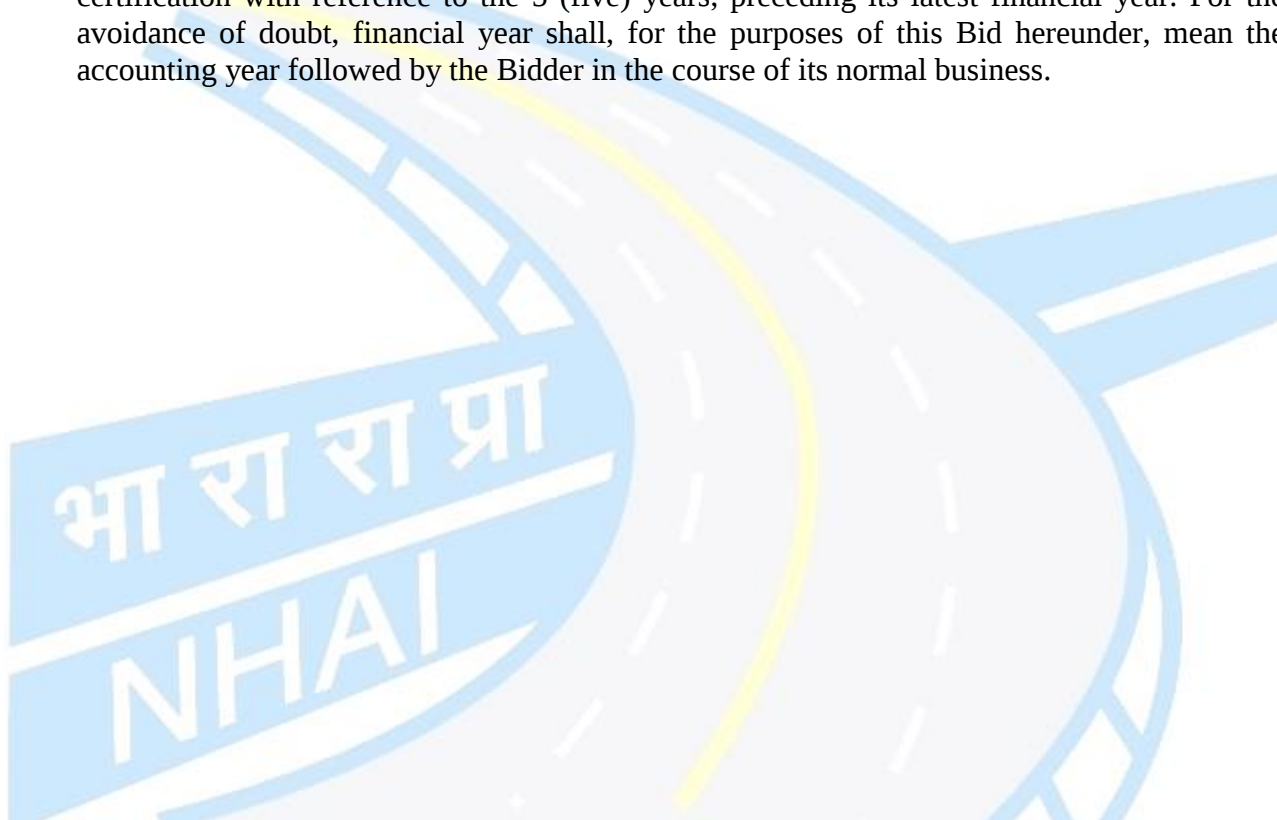
Sl. No.	EVENT(S)	DATE (Unless otherwise notified separately)
1.	Issue of Revised Bid Document	21/06/2017
2.	Pre bid Meeting	Not Applicable Already held on 05/05/2017
3.	Issue of Pre-bid minutes on NHAI website	Not Applicable Revised RFP document superseding existing RFP document dated 12.4.2017 issued incorporating required clarifications to the pre-bid meeting held on 05/05/2017. Accordingly, no separate corrigendum /addendum issued.
4.	Downloading formats for financial bid submission.	24 hours before Bid due date
5.	Physical submission of mandatory documents	Before 18:00 Hrs. on Bid due date
6.	Last date/ time for submission of bids (i.e. Bid due date)	Before 11:00 Hrs. 17/07/2017 (Monday)
7.	Opening of <i>Technical bids</i>	11:30 Hrs. 18/07/2017 (Tuesday)
8.	Opening of Financial bids	To be intimated to shortlisted/ pre-qualified bidders separately

**TENDER APPLICATION FEE, BID SECURITY AND GENERAL TERMS OF BIDDING**

- 1.1. Bidder should pay **Tender Application Fee** (non-refundable) **INR 25,000/- (Rupees Twenty Five Thousand)** only in the form of Demand Draft/ Banker's Cheque/ Pay order, drawn on a scheduled bank in India and payable to "National Highways Authority of India" at New Delhi.
- 1.2. The **Bid Security** of **INR 1.5 crore (Rupees one crore and fifty lakh only)** shall be furnished in the form of Demand Draft/ Banker's Cheque/ Pay order, drawn on a scheduled bank in India and payable to "**National Highways Authority of India**" at **New Delhi** or the Bidders will have an option to provide Bid Security in the form of bank guarantee as per format prescribed in this document and in such event, the validity period of the bank guarantee, shall not be less than 180 (one hundred and eighty) days from the Bid Due Date, inclusive of a claim period of 60 (sixty) days, and may be extended as may be mutually agreed between the Authority and the Bidder from time to time. NHAI shall not be liable to pay any interest on the Bid Security deposit.
- 1.3. Any bid *not accompanied* by an acceptable Bid Security and / or Tender Application Fee in the prescribed manner shall be summarily rejected.
- 1.4. The Bid Security of all unsuccessful bidders shall be returned without interest normally within 30 days after finalization of the tender process i.e. signing of the Contract Agreement with the successful bidder. The bidder should indicate details of their bank account number for crediting the refund of bid security through ECS (RTGS/NEFT). This information should be provided in the technical bid.
- 1.5. **FORFEITURE OF BID SECURITY:** The Bid Security shall be forfeited and/ or appropriated by NHAI as mutually agreed genuine pre-estimated compensation and as damages payable to NHAI for, *inter-alia*, time, cost and effort of NHAI without prejudice to any other right or remedy that may be available to NHAI under the provisions in the RFP and/or under the Contract, or otherwise, under the following circumstances:
 - (a) If a bidder submits a non-responsive bid:
Subject, however, that in the event of forfeiture and/ or appropriation of bid security occurring due to operation of this sub para, the damage so claimed by NHAI shall be restricted to 5% of the value of bid security.
 - (b) If a Bidder engages in a corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice; or
 - (c) If the Bid is withdrawn during the intervening period between the bid due date and the expiration of the Bid Validity; or
 - (d) If the bidder tries to influence the evaluation process; or
 - (e) If a Bidder having been notified Successful Bidder by NHAI with the issuance of Letter of Award (LOA) during the bid validity period:
 - (i) Fails or refuses to furnish the Performance Security, in accordance with the conditions of RFP; or
 - (ii) Fails or refuses to execute/sign the Contract within the stipulated time frame.
- 1.6. No Bidder shall submit more than one Bid for the Project. A Bidder bidding individually or as a member of a JV/Consortium shall not be entitled to submit another Bid either individually or as a member of any JV/ Consortium, as the case may be.



- 1.7. Any condition or qualification or any other stipulation contained in the Bid shall render the Bid liable to rejection as a non-responsive Bid.
- 1.8. The Bidding documents including this RFP and all attached documents, provided by the Authority are and shall remain or become the property of the Authority and are transmitted to the Bidders solely for the purpose of preparation and submission of a Bid in accordance herewith. Bidders are to treat all information as strictly confidential and shall not use it for any purpose other than for preparation and submission of their Bid. The provisions of this Clause 1.8 shall also apply mutatis mutandis to Bids and all other documents submitted by the Bidders, and the Authority will not return to the Bidders any Bid, document or any information provided along therewith.
- 1.9. Notwithstanding anything to the contrary contained herein, in the event that the Bid Due Date falls within three months of the closing of the latest financial year of a Bidder, it shall ignore such financial year for the purposes of its Bid and furnish all its information and certification with reference to the 5 (five) years, preceding its latest financial year. For the avoidance of doubt, financial year shall, for the purposes of this Bid hereunder, mean the accounting year followed by the Bidder in the course of its normal business.



**ELIGIBILITY AND PRE-QUALIFICATION CRITERIA****2.1 Bidders fulfilling the criteria listed below will be empanelled:**

	Criteria
A	Firm Details a) Field of Business: The bidder should be in the field of Information Technology / Electronics/ Communication Technology including OEM thereof or System Integrator for at least last 5 years (prior to the date of bid submission). Copy of relevant and valid PO/ WO/LOA/ Contract more than 5 years before the date of bid submission should be submitted in the Technical bid. b) Registration Status: The bidder must be a company incorporated / registered in India under the Companies Act 1956 for at least 5 years (prior to the date of bid submission). Certificate of incorporation / registration must be submitted as documentary proof for the same. OR A wholly owned subsidiary Company registered in India of a Foreign Company having requisite experience. For considering the experience of the Parent Company, the subsidiary Company registered in India should provide an undertaking from their Parent Company confirming thereby: (i) Perpetual and unconditional access to expertise, personnel and facilities of the Parent Company to the Indian Company; and (ii) Sharing of risks and profits of the Indian Company by the Parent Company; In such case only the experience and the details of the Parent Company will be considered, otherwise the details/ experience of Indian Company only will be considered. Under this concept, there is no involvement of lead bidder; the Indian company (subsidiary) shall be participating as a sole bidder. c) Joint Venture: A Joint Venture (JV)/ Consortium is permissible subject to fulfilling following conditions: (i) maximum number of members in the JV or Consortium shall be three; (ii) the parties in a JV or Consortium shall be jointly and severally liable; (iii) members of the JV/ Consortium shall nominate one member as the lead member (the “Lead Member”), who shall have at least 26% (twenty six per cent) stakes in the JV/ Consortium. The nomination(s) shall be supported by a Power of Attorney, as per the format at Form T-4, signed by all the members of the JV/Consortium. (iv) the Lead Partner, shall be the technology / solution provider firm / system integrator amongst the parties in JV / Consortium and shall fulfill eligibility condition at a) above; (v) the Bid should include a brief description of the roles and responsibilities of individual members, particularly with reference to financial, technical and O&M obligations. (vi) an individual Bidder cannot at the same time be member of a JV/ Consortium applying RFP. Further, a member of a particular JV/ Consortium cannot be member of any other JV/ Consortium applying for RFP. (vii) members of the JV/ Consortium shall enter into a binding Joint Bidding Agreement, substantially in the form specified at Form T-5 (the “Joint Bidding Agreement”), for the purpose of submitting a Bid. (viii) the eligibility/ experience of each partner of JV or Consortium shall be considered in proportion to their stakes in the JV/ Consortium in order to meet the minimum aggregate requirements; and the eligibility/ experience of any partner of JV or Consortium shall be considered only if the partner is proposed to have at least twenty six percent (26%) stakes in the JV/ Consortium.



	Criteria
	Note: - No change in the constitution of JV/ Consortium will be allowed during the entire period of contract validity. - In the event of failure of sustenance of JV/ Consortium, the contract shall be cancelled, bid security forfeited and each constituent of JV/ Consortium will be debarred for 2 years from any works of NHAI. Further, the contracts awarded, if any, shall be terminated and the performance bank guarantees shall be forfeited by NHAI. - The documentary proof in support of fulfilling the eligibility criteria by the Consortium/ JV, along-with a Joint Bidding Agreement as well as other relevant documents as stipulated in the RFP document shall be submitted as part of the bid. - The Joint Bidding Agreement should clearly describe the responsibility of each partner. d) Turnover: The Bidder should have average annual turnover from Information Technology / Communication Technology / System Integration of INR 100 Crore in last 3 financial years immediately preceding the Bid due date. Certificate from the Statutory Auditor in the prescribed format should be submitted in technical bid. e) Net worth: The Bidder should have positive net worth of at least INR 17.50 Crore in financial year immediately preceding the Bid due date. Certificate from the Statutory Auditor in the prescribed format should be submitted in technical bid. For the purpose of this RFP, net worth (the “Net Worth”) shall mean the aggregate value of the paid-up share capital and all reserves created out of the profits and securities premium account, after deducting the aggregate value of the accumulated losses, deferred expenditure and miscellaneous expenditure not written off, as per the audited balance sheet, but does not include reserves created out of revaluation of assets, write back of depreciation and amalgamation. In case of a JV/ Consortium, the combined Turnover and net worth of those members, who have at least 26% (twenty six per cent) stakes in the JV/ Consortium, should satisfy the above conditions of eligibility. Provided that each member of the Consortium shall have a minimum Net Worth of INR 8.75 Crore in the immediately preceding financial year. Note: (1) The Bids must be accompanied by the Audited Annual Reports of the Bidder (of each Member in case of a Consortium) for the last 3 (three) financial years, preceding the year in which the Bid is made. (2) In case the annual accounts for the latest financial year are not audited and therefore the Bidder cannot make the same available, the Bidder shall give an undertaking to this effect and the statutory auditor shall certify the same. In such a case, the Bidder shall provide the Audited Annual Reports for 3 (three) years preceding the year for which the Audited Annual Report is not being provided. Accordingly, for meeting the Average Annual Turnover criteria, such financial years for which Audited Annual Reports provided shall be considered and Net worth of the latest Audited Annual Report available shall be considered



	Criteria
	for the purpose of this RFP. (3) Certificate(s) from its statutory auditors specifying the Annual Turnover during the last 3 financial years and net worth of the Bidder, as at the close of the preceding financial year as per Format T-8 shall be provided in support of their claim.
B	Technical Strength: Control Centre Experience: The bidder must have experience of having successfully executed similar nature of work during last 5 financial years as under - Single work of INR 60* crores or above Or two works of INR 37* crores each or above Or three works of INR 30* crores each or above <i>*Note: Total contract value of the works means total capital cost and cost of Operations and Maintenance (if applicable) for a period of one year.</i> In case of a JV/ Consortium, the aforesaid Technical Strength shall be fulfilled by the Lead Member only. <u>Definition of similar works:</u> Establishment of state-of-the-art National / State level Control / Command Centre / Emergency Response Center with 24x7 CCTV based Surveillance involving multiple locations (at least 100 locations) under reputed PSUs/ State Governments/ Central Government or its Department/ Enforcement agencies/ Autonomous Body etc. Bidder should submit relevant details of each projects in the prescribed format and should enclose Go-live / acceptance / completion Certificate issued by the customer and Work Order / Purchase order / Copy of contract / Letter of Award highlighting detailed scope of project implemented within the last 5 financial years prior to the Bid due date as proof for the same.
C	A Bidder blacklisted/ declared ineligible by Ministry of Road Transport & Highways, Government of India or its executing agencies like NHAI, NHIDCL etc. shall be ineligible to apply for participating in this RFP. <i>Self-declaration to this effect shall be submitted as part of the Bid.</i>
D	A Bidder determined non-performing or having been terminated any project during last three years by Ministry of Road Transport & Highways, Government of India or its executing agencies like NHAI, NHIDCL etc. will not be eligible to participate in this RFP. <i>Self-declaration to this effect shall be submitted as part of the Bid.</i>

E Additional Conditions:

E.1 The OEM of each component/ equipment should have its own presence in India with service/support offices to ensure smooth after sales service support on site.

The bidder must submit the datasheet of each component in the Technical Submission as part of the Bid, clearly mentioning the make, model, country of origin, and end of life of each component/ equipment.



E.2 To ensure seamless integration, the Service Provider shall deploy equipment of same OEM/ different OEM having seamless interoperability for each categories of the solution components as mentioned below:

- Surveillance – Cameras (Fixed and PTZ), Video Management software
- Network – Router and switches
- Security – Firewalls and any other security solution
- Voice and Video Conferencing Solution – Phones, VC Hardware, MCU, Call control
- Computing – Workstations, Servers and storage
- Interior works and technical furniture at control centres

The bidder must submit the documentary proof for the above mentioned requirement and non-compliance matrix for the ToR in the Technical Submission as part of the Bid.

2.2 Conflict of Interest:

2.2.1 A Bidder shall not have a conflict of interest that may affect the bidding process (the “**Conflict of Interest**”). Any Bidder found to have a Conflict of Interest shall be disqualified. In the event of disqualification, NHAI shall forfeit and appropriate 5% of the value of Bid Security as mutually agreed genuine pre-estimated loss and damage likely to be suffered and/ or incurred by the NHAI and not by way of penalty for, *inter alia*, the time, cost and effort of NHAI including consideration of such Bidder’s Bids, without prejudice to any other right or remedy that may be available to NHAI hereunder or otherwise.

2.2.2 NHAI requires that the selected bidder provides professional, objective, and impartial advice and at all times hold NHAI’s interest’s paramount, avoid conflicts with other assignments or its own interests. The selected bidder shall not accept or engage in any assignment that would be in conflict with its prior or current obligations to other clients, or that may place it in a position of not being able to carry out the assignment in the best interests of NHAI.

2.2.3 A Bidder shall be deemed to have a Conflict of Interest affecting the bidding process, if:

- (a) a constituent¹ of Bidder is also a constituent of another Bidder; or
- (b) such Bidder, its member or its associate receives or has received any direct or indirect subsidy or grant from any other Bidder, its member or its associate; or
- (c) such Bidder has the same legal representative for purposes of this Bid as any other Bidder; or
- (d) such Bidder, its member or its associates has a relationship with another Bidder, its member or its associates, directly or through common third parties, that puts them in a position to have access to each other’s information about the bids, or if they actually share or access each other’s information regarding the bids or to influence the bid of either or each of the other Bidder; or
- (e) there is a conflict among this and other assignments of the Bidder (including its member, associates, personnel and subordinates) and any subsidiaries or entities controlled by such Bidder or having common controlling shareholders. The

¹ For the purpose of this clause the word “constituent” shall include Promoter, Director, Shareholder, Partner, Agent, representative etc.



duties of the Bidder will depend on the circumstances of each case. While providing services to NHAI for this particular assignment, the Bidder shall not take up any assignment that by its nature will result in conflict with the present assignment; or

- (f) a Company/firm which has been engaged by the Authority to provide goods and/or works and/or services for a project, and its associates, will be disqualified from providing consulting services for the same project and/or associated services, conversely, a firm hired to provide services for the preparation or implementation of a project, and its associates, will be disqualified from subsequently providing goods or works or services related to the same project and/or associated services; or
- (g) Bidders should be deemed to be in a conflict of interest situation if it can be reasonably concluded that their position in a business or their personal interest could improperly influence their judgment in the exercise of their duties. The process for selection of Bidders should avoid both actual and perceived conflict of interest; or
- (h) The Bidder, its member or Associate (or any constituent thereof) and any other Bidder, its member or any Associate thereof (or any constituent thereof) have common controlling shareholders or other ownership interest; provided that this disqualification shall not apply in cases where the director in direct shareholding of a Bidder, its member or an Associate thereof (or any shareholder thereof having a shareholding of not more than 25%(twenty five percent) of the paid up and subscribed capital; of such Bidder, Member or Associate, as the case may be) in the other Bidder, its Member or Associate, is not more than 25% (Twenty five percent) of the subscribed and paid up equity share capital thereof; provided further that this disqualification shall not apply to any ownership by a bank, insurance company, pension fund or a public financial institution referred to in section 4A of the Companies Act, 1956/2013. For the purposes of this Clause 2.2.3, indirect shareholding held through one or more intermediate persons shall be computed as follows: (aa) where any intermediary is controlled by a person through management control or otherwise, the entire shareholding held by such controlled intermediary in any other person (the “**Subject Person**”) shall be taken into account for computing the shareholding of such controlling person in the Subject Person; and (bb) subject always to sub-clause (aa) above, where a person does not exercise control over an intermediary, which has shareholding in the Subject Person, the computation of indirect shareholding of such person in the Subject Person shall be undertaken on a proportionate basis; provided, however, that no such shareholding shall be reckoned under this sub-clause (bb) if the shareholding of such person in the intermediary is less than 26% of the subscribed and paid up equity shareholding of such intermediary; or
- (i) For purposes of this RFP Document, Associate means, in relation to the bidder, a person who controls, is controlled by, or is under the common control with such bidder. As used in this definition, the expression “control” means, with respect to a person which is a company or corporation, the ownership, directly or indirectly, of more than 50% (fifty per cent) of the voting shares of such person, and with respect to a person which is not a company or corporation, the power to direct the management and policies of such person by operation of law or by contract.



2.2.4 The normal way to identify conflicts of interest is through self-declaration by the Bidder. Where a conflict exists, which has not been declared, competing companies are likely to bring this to the notice of NHAI. All conflicts must be declared as and when the Bidder becomes aware of them.

2.3 Policy for Preference to domestically manufactured electronic products in Government procurement as per Department of Electronics and Information Technology (DeitY), Ministry of Communication and Information Technology Notification No.33(3)/2013-IPHW dated 23/12/2013

2.3.1 Purchaser reserves the right for providing preference to domestically manufactured electronic products in terms of the Department of Electronics and Information Technology (DeitY) **Notification No.33(3)/2013-IPHW dated 23.12.2013** read with **Notification No.33(3)/2013-IPHW dated 22/05/2014** and Guidelines issued there under through **Notification No. 8(78)/2010-IPHW dated 12/06/2013**. A copy of the aforesaid Notifications / Guidelines can be downloaded from DeitY website i.e. URL <http://meity.gov.in/esdm/pma>. Purchase preference for domestic manufacturer, methodology of its implementation, value addition to be achieved by domestic manufacturers, self-certification, and compliance and monitoring shall be as per the aforesaid Guidelines/ Notifications. The Guidelines may be treated as an integral part of the tender documents.

2.3.2 The modalities through which the preference for Domestically Manufactured Electronic Products (DMEPs) shall be operated are as follows:

- (a) The electronic products for which preference will be provided to domestic manufacturers shall be **i) Desktops, Servers and Printers, ii) Ethernet switches (L2), iii) Copper and Optical Fibre Cables, iv) CCTV and Surveillance Cameras including Video Management System and Video Analytics Module.**
- (b) The quantity of procurement for which preference will be provided to domestic manufactures shall be **30%** of the total tendered quantity.
- (c) Percentage of domestic value addition, which qualifies the electronic product to be classified as domestically manufactured shall be **30%** for the financial year **from 01/04/2015 to 31/03/2016**
- (d) The preference to DMEP shall be subject to meeting technical specifications and matching L1 price.



- 2.3.3 Domestic manufacturers are required to indicate the domestic value addition in terms of BoM for the quoted product, in terms of aforesaid guidelines, in their bid in the following format:

Format for Domestic Value Addition in terms of Guidelines issued for procurement of notified electronic products by Government.

Item No	Item Description	Manufacturer / Supplier	Country of Origin	Value	Domestic Value Addition in Percentage
1					
2					
..n					

- 2.3.4 Bidders, claiming to bid in the status of domestic manufacturer, are required to give an undertaking in the format as given as Form 1 of the guidelines **Notification No. 8(78)/2010-IPHW dated 12/06/2013**. Furnishing of false information on this account shall attract penal provisions as per Guidelines/Notification.

- 2.3.5 Procedure for award of contracts involving procurement from domestic manufacturers:

“For each electronic product proposed to be procured, among all technically qualified bids, the lowest quoted price will be termed as L1 and the rest of the bids shall be ranked in ascending order of price quoted, as L2, L3, L4 and so on. If L1 bid is of a domestic manufacturer, the said bidder will be awarded full value of the order. If L1 bid is not from a domestic manufacturer, the value of the order awarded to L1 bidder will be the balance of procurement value after reserving specified percentage of the total value of the order for the eligible domestic manufacturer. Thereafter, the lowest bidder among the domestic manufacturers, whether L2, L3, L4 or higher, will be invited to match the L1 bid in order to secure the procurement value of the order earmarked for the domestic manufacturer. In case first eligible bidder (i.e. domestic manufacturer) fails to match L1 bid, the bidder (i.e. domestic manufacturer) with next higher bid will be invited to match L1 bid and so on.

*However, the procuring agency may choose to divide the order amongst more than one successful bidder as long as all such bidders match L1 and the criteria for allocating the tender quantity amongst a number of successful bidders is clearly articulated in the tender document itself. In case all eligible domestic manufacturers fail to match the L1 bid, the actual bidder holding L1 bid will secure the order for full procurement value”. **Only those domestic manufacturers whose bids are within 20% of the L1bid would be allowed an opportunity to match L1 bid.***

**Form 1****Format for Affidavit of Self Certification regarding Domestic Value Addition in an Electronic Product to be provided on Rs. 100/- Stamp Paper.**

Date :

I _____ S/o, D/o, W/o _____, Resident of _____ do hereby solemnly affirm and declare as under.

That I will agree to abide by the terms and conditions of the policy of Government of India issued vide **Notification No.33 (3)/2013-IPHW dated 23.12.2013**

That the information furnished hereinafter is correct to best of my knowledge and belief and I undertake to produce relevant records before the procuring authority or any authority so nominated by the Department of Electronics and Information Technology, Government of India for the purpose of assessing the domestic value-addition.

That the domestic value addition for all inputs which constitute the said electronic products has been verified by me and I am responsible for the correctness of the claims made therein.

That in the event of the domestic value addition of the product mentioned herein is found to be incorrect and not meeting the prescribed value-addition norms, based on the assessment of an authority so nominated by the Department of Electronics and Information Technology, Government of India for the purpose of assessing the domestic value-addition. I will be disqualified from any Government tender for a period of 36 months. In addition, I will bear all costs of such an assessment.

That I have complied with all conditions referred to in the Notification No., wherein preference to domestically manufactured electronic products in Government procurement is provided and that the procuring authority is hereby authorised to forfeit and adjust my EMD and other security amount towards such assessment cost and I undertake to pay the balance, if any, forthwith.

I agree to maintain the following information in the Company's record for a period of 8 years and shall make this available for verification to any statutory authorities:

- Name and details of the Domestic Manufacturer (Registered Office, Manufacturing unit location, nature of legal entity)
- Date on which this certificate is issued.
- Electronic Product for which the certificate is produced.
- Procuring agency to whom the certificate is furnished.
- Percentage of domestic value addition claimed.
- Name and contact details of the unit of the manufacturer.
- Sale Price of the product.
- Ex-Factory Price of the product.
- Freight, Insurance and handling.
- Total Bill of Material.
- List and total cost value of inputs used for manufacture of the electronic product.
- List and total cost of inputs which are domestically sourced. Please attach certificates from suppliers, if the input is not in-house.
- List and cost of inputs which are imported, directly or indirectly.

For and on behalf of _____ (Name of firm/entity)

Authorised signatory (To be duly authorised by the Board of Directors)

<Insert Name, Designation and Contact No.>



CLARIFICATION REGARDING RFP DOCUMENT

3.1 A prospective Bidder requiring any clarification regarding the RFP may notify NHAI in writing or e-mail at NHAI's address indicated in the invitation to Bid. NHAI will respond to any request for clarification which is received before the pre-Bid meeting.

3.2 PRE-BID MEETING

- (a) The Bidder or his authorized representative is invited to attend a pre-Bid meeting which will take place at NHAI, G - 5 & 6, Sector-10, Dwarka, New Delhi-110075 as mentioned in the Schedule of Events.
- (b) The purpose of the meeting will be to clarify issues and to answer questions on any matter pertaining to this RFP document. All Bidders are requested to go through the RFP document carefully and submit any queries/ clarifications addressed to the General Manager (Electronics Division) in the format prescribed in Part III. The Bidder is requested to submit any questions / queries in writing or by email² so as to reach NHAI well before the scheduled meeting.
- (c) Minutes of the meeting including the text of the questions (without identifying the source of enquiry) and the responses will be hosted on NHAI's website/ e-tender portal only.
- (d) Any modification in the RFP document which may become necessary as a result of the deliberations in the pre-Bid meeting shall be made by NHAI separately through issue of an Addendum/ Amendment and not through the minutes of the pre-Bid meeting and the same will also be hosted on NHAI's website/ e-tender portal.

² E-mail: deepaksaxena@nhai.org



ACCESSING BID DOCUMENTS, PREPARATION AND SUBMISSION OF BID

- 4.1 Detailed RFP document can be viewed / downloaded from NHAI website.
- 4.2 Bidder(s) have to pay (a) the Tender Application Fee (non-refundable); and (b) Bid Security, in the prescribed manner.

4.3 ACCESSING/PURCHASING OF BID DOCUMENTS:

- (i) It is mandatory for all the Bidders to have class-III digital signature certificate (with both Signing and encryption certificate) (in the name of person who will sign the Bid) from any of the licensed Certifying Agency (“CAs”) [Bidders can see the list of licensed CAs from the link www.cca.gov.in] to participate in e-tendering of NHAI.

The Authorized Signatory holding Power of Attorney (POA) or the person executing/delegating such POA, shall only be the Digital Signatory. In other cases, the bid shall be considered non-responsive

- (ii) To participate in the submission of the bid against the RFP, it is mandatory for the Bidders to get themselves registered with the NHAI's e-tender portal³ and to have user ID & password.
- (iii) Following may be noted-
- (a) Registration should be valid at least up to the date of submission of Bid.
 - (b) Bids can be submitted only during the validity of registration with the NHAI's e-tender portal.
 - (c) The amendments/clarifications to the RFP, if any, will be hosted on the NHAI's website as well as e-tender portal.
 - (d) If the Bidder is already registered with e-tendering portal of NHAI and validity of registration has not expired, the Bidder is not required to register afresh.
- (iv) For Help, please contact e-tendering Cell and Help Desk Support. Support staff at E-Tendering Help desk shall be available on all week days (Monday to Friday) from 09:30 AM to 6:00 PM except on Gazetted Holidays. Details may be seen on the NHAI website.

4.4 PREPARATION & SUBMISSION OF BIDS:

- (i) Detailed **RFP** may be downloaded from NHAI'S website and / or e-tender portal of NHAI and bid shall be submitted online following the instruction appearing on the screen.
- (ii) The following documents shall be submitted in ORIGINAL to NHAI before the prescribed date & time for submission of Bids.
- a. Tender Application Fee in the manner prescribed.
 - b. Bid Security in the manner prescribed.
 - c. Original Power of Attorney in favour of Authorized Signatory in the Format prescribed in this document.

³ Visit NHAI website to access e-tender portal



- d. if applicable, Power of Attorney for Lead Member of JV/ Consortium in the format prescribed in this document.
- e. if applicable, Joint Bidding Agreement for JV/ Consortium in the format prescribed in this document.

(iii) The Technical and Financial bid should be submitted online only in the prescribed format given on the e-tender portal. No other mode of submission is accepted.

4.5 **Bid Validity:** The bid should remain valid for a period of 120 calendar days from the bid due date. NHAI will make its best efforts to complete the evaluation process and work award within the bid validity period. Under exceptional circumstances, prior to expiry of the bid validity, NHAI may request bidder to extend the bid validity for specified additional period. Such request by NHAI and reply / response from bidder shall be in writing. The bidder(s) not agreeing to such extension will be allowed to withdraw their bids without forfeiture of their bid security.

4.6 **Bid Composition:** The Bid shall comprise the following:

(a) PART 1 Document in original to be physically submitted at NHAI before prescribed time limits under schedule of important events / activities)

The Documents as specified in para 4.4(ii) above shall be placed in a sealed envelope. The envelope should bear the following identification:

“RFP for Command and Control Centre including Video Conference, CCTV Surveillance & Monitoring of Vehicular Congestion on National Highway Toll Plazas.” and addressed to:

ATTN OF: Sh. Deepak Saxena
DESIGNATION: General Manager (Electronics)
ADDRESS: National Highways Authority of India
G 5 & 6 Sector 10, Dwarka New Delhi
E-MAIL: deepaksaxena@nhai.org

The envelope should also bear the bidder's name & address. If the envelope is not sealed and marked as above, NHAI will assume no responsibility for the misplacement or premature opening of the contents of the envelope and consequent losses, if any, suffered by the Bidder. Such Bids may also be declared non-responsive.

Notes:

- (i) Documents as specified above, if received by NHAI after the prescribed deadline (bid due date) will be returned unopened to the Bidder
- (ii) If any requisite document/ certificate are not in the prescribed format the same shall not be considered while evaluating the Bids and the same may lead to Bid being declared as non-responsive.
- (iii) The Technical Bid shall not include any commercial quote.

(b) PART 2 (Technical Bid to be uploaded on E-tender portal)

- i. Technical Bid comprising various formats Form T-1 to Form T-11 prescribed in Part III.
- ii. Stipulated documentary evidence attested by the authorised signatory in support of their claim for fulfilling the prescribed eligibility criteria and an undertaking on the bidder's letterheads to the fairness of these documents in support of their claim while submitting the Bids



- iii. Undertaking that the bidder has not been determined non-performing or having been terminated any of his project during last three years by Ministry of Road Transport & Highways, Government of India or its executing agencies like NHAI, NHIDCL etc.
- iv. Undertaking that the bidder has not been blacklisted/declared ineligible by Ministry of Road Transport & Highways, Government of India or its executing agencies like NHAI, NHIDCL etc.
- v. Self-declaration i.r.o. any conflict of interest prescribed under para 2.2 of eligibility criteria;
- vi. Other documents
 - a. Copy of Certificate of Incorporation of Company;
 - b. MoA and AoA of the Company / or other document showing object clause of the firm; and
 - c. Signed copy of Integrity Pact in the prescribed format;
 - d. Any other document providing additional information in respect of technical / financial strength as well as technical experience etc. {Ref item No E.1 and E.2 under Eligibility Criteria read with Notes under Form T-9.
 - e. Undertaking as required against claim of bidder to avail Preference to DMEP

(c) PART 3 Financial Bid (In the prescribed format on E-Tender portal of NHAI)

- a. Financial bid shall be submitted online on e-tender portal on the prescribed format which may be downloaded⁴ well before the bid due date from e-tender portal.
- b. The bid should include all the charges payable in full compliance to the Scope of Work and other terms specified in the RFP document. No additional payments whatsoever are envisaged.
- c. The bid should include all statutory taxes/ levies / surcharge on tax etc. but excluding service tax/ GST (as applicable on services). Any tax, and / or any other levies, if altered in future and payable under the law, the same shall be borne by the bidder.
- d. applicable service tax/ GST (as applicable on services) shall be reimbursed by NHAI separately on production of proof of payment; and
- e. Bidder should note that Income tax payable by the Bidder is not reimbursable by NHAI. TDS will be applicable on all payments made by NHAI as per applicable law.
- f. In case of any difference in figures and words, the amount mentioned in words will prevail.

4.7 COST OF BIDDING

The Bidder shall be responsible for all the cost associated with the preparation and submission of their Bids including subsequent negotiation, visits to NHAI, project site etc. NHAI shall not be responsible in any way liable for such costs, regardless of the conduct or outcome of the bidding process.

4.8 LANGUAGE OF THE BIDS

The Bid and all communications in relation to or concerning the RFP shall be in **English language**. No supporting document or printed literature shall be submitted with the Bid unless specifically asked for and in case any of the documents are in another language, it

⁴ Kindly refer schedule of important events / activities.



must be accompanied by an accurate translation of the relevant passages in English, in which case, for all purposes of interpretations of the Bid, the original documents attached with the bid or the information incorporated in the bid shall be final and binding.

4.9 MODIFICATION /SUBSTITUTION/ WITHDRAWAL OF BIDS:

- (i) The Bidder may modify, substitute or withdraw its e-bid after submission prior to the Bid Due Date. No Bid shall be modified, substituted or withdrawn by the Bidder on or after the Bid Due Date.
- (ii) Any alternative/modification in the Bid or additional information supplied subsequent to the Bid Due Date, unless the same has been expressly sought for by the Authority, shall be disregarded.
- (iii) For modification or e-bid, bidder has to click on Edit Bid Option and resubmit digitally signed modified bid.
- (iv) For withdrawal of bid, bidder has to click on withdrawal icon at e-tendering portal and can withdraw its e-bid.
- (v) Before withdrawal of a bid, it may specifically be noted that after withdrawal of a bid for any reason, bidder cannot re-submit e-bid again.

4.10 OPENING & EVALUATION OF BIDS

- (i) Opening and evaluation of bids will be done through online process.
- (ii) The bids will be opened on-line on the due date and time prescribed in the RFP document in the presence of the bidders who choose to attend. The Authority will subsequently examine and evaluate the bids in accordance with the provisions set out.
- (iii) Prior to evaluation of bids, the Authority shall determine whether each Bid is responsive to the requirements of this RFP.
- (iv) 'Financial Bid' of non-responsive bidders shall not be opened.
- (v) The Technical bid shall be opened of those bidders only who ensure physical submission of mandatory documents in original in compliance to provision at 4.4 (ii) Part-1.

4.11 To assist in the examination, evaluation, and comparison of Bids, NHAI may, at its discretion, ask any Bidder for clarification of its Bid. The request for clarification and the response shall be in writing or by fax or e-mail, but no change in the price or substance of the Bid shall be sought, offered, or permitted except as required to confirm the correction of arithmetic errors discovered by NHAI in the evaluation of the Bids.

4.12 Except in case any clarification is asked by NHAI, no Bidder shall contact NHAI on any matter relating to its Bid from the time of the Bid opening to the time the Contract is awarded. If any Bidder wishes to bring additional information to the notice of NHAI, it should do so in writing at the address prescribed in the Notice Inviting Tender.

**BID EVALUATION CRITERIA AND SELECTION PROCEDURE**

- 5.1 The bids shall be opened on-line by the Evaluation Committee on the date and time prescribed. Prior to evaluation of the bids, NHAI shall determine as to whether each bid is responsive to the requirements of this RFP document. A bid will be declared non-responsive in case:
- (a) If a bidder submits more than one bid against this RFP
 - (b) The physical submissions are incomplete / inadequate to the requirements of the RFP Documents.
 - (c) Bid is submitted without applicable fee(s) and bid security
 - (d) If the Authorized Signatory holding Power of Attorney (POA) or the person executing/delegating such POA and Digital Signatory are not the same
 - (e) If a bidder submits a conditional bid or makes changes in the terms and conditions given in this RFP document
 - (f) Failure to comply with all the requirements of RFP document by a bidder
 - (g) If the bid is not submitted in the formats prescribed in the RFP document
 - (h) If any requisite document/ certificate is not in the prescribed format the same shall not be considered while evaluating the bids and the same may lead to bid being declared as non-responsive.
 - (i) If the envelope containing physical submission is not sealed and marked as prescribed in the RFP document
 - (j) A bid valid for a period of time shorter than prescribed in the RFP document
- 5.2 A three-stage procedure shall be adopted for evaluation of the bids.
- 5.3 **Bid Evaluation - First Stage:** The Evaluation Committee shall carry out initial screening of technical bids by examining the statement of qualification, furnished by the Bidder in support of their fulfilment of eligibility against the criteria prescribed in this RFP.
- 5.4 **Bid Evaluation - Second Stage:** The Evaluation Committee shall carry out technical evaluation by applying the evaluation criteria and point system specified in the data sheet. Each responsive bid shall be attributed a technical score (St.) The technical bid should score **at least 80 points** to be considered shortlisted for subsequent stage of bid evaluation i.e. opening financial bid.
- 5.5 **Technical Presentation to NHAI**
Before completing technical evaluation - second stage, NHAI will invite all responsive bidders to make a detailed technical presentation to NHAI. Schedule of technical presentation shall be informed. Each responsive bidder shall be allowed 15 minutes to make a detailed technical presentation to the evaluation committee. The presentation should be crisp and should precisely address following aspects concerning the bidder:
- (a) Detailed methodology and technical work plan
 - (b) Broad system architecture and design
 - (c) Technology Service Providers which the bidder proposes to incorporate in the solution proposed to address the ToR requirements.
 - (d) Non-Compliance Matrix for ToR.
 - (e) Certification(s), Affiliation(s), Authorised Partner(s) of OEM/Other leading technology providers/ System Integrators.
 - (f) Ratings if any, achieved by international/national agencies in the field of IT/Communications/ Electronics / Networking

Note: Bidders are instructed to strictly adhere to the prescribed time limit for their presentation.

**5.6 Data Sheet for Technical Score:**

S. N.	Criteria	Score
(a)	No. of Years of experience of the bidder (maximum score 15)	
(a.1)	Experience is 5 years or more but less than 7 years	10.0
(a.2)	Experience is 7 years or more but less than 10 years	12.5
(a.3)	Experience is 10 years or more	15.0
(b)	Technical strength as per eligibility criteria (maximum score 30)	
(b.1)	Parameter	Score / unit
(b.2)	Each work of INR. 60 crores or above	25
(b.3)	Each work of INR. 37 crores or above	12.5
	Each work of INR. 30 crores or above	8.5
	Evaluated score =	$25*x + 12.5*y + 8.5*z$ Subject to max 30
(c)	Turnover of the Bidder in last three financial years (maximum score 10)	
(c.1)	Average turnover 100 Crore or more but less than 200 Crore	5.0
(c.2)	Average turnover 200 Crore or more but less than 400 Crore	7.5
(c.3)	Average turnover 400 Crore or more	10.0
(d)	Net worth of Bidder in last three financial years (maximum score 15)	
(d.1)	Average net worth 17.5 Crore or more but less than 25 Crore	10.0
(d.2)	Average net worth 25 Crore or more but less than 50 Crore	12.5
(d.3)	Average net worth 50 crore or more	15.0
(e)	Detailed methodology and technical work plan supported with broad system architecture and design based on the physical submission under technical bid (maximum score 15)	
(e.1)	Average	4.0
(e.2)	Good	8.0
(e.3)	Very Good	12.0
(e.4)	Excellent	15.0
(f)	Detailed methodology and technical work plan supported with broad system architecture and design based on technical presentation to NHAI (maximum score 15)	
(f.1)	Average	4.0
(f.2)	Good	8.0
(f.3)	Very Good	12.00
(f.4)	Excellent	15.00
	Total	100

5.7 Bid Evaluation - Third Stage: In this stage, financial bids of only those Bidders shortlisted after second stage shall be opened. The date of opening shall be intimated to such bidders. The work shall be awarded on **least cost basis** (Successful Bidder). The Successful Bidder shall be awarded the work subject to NHAI verifying the documents submitted by it.

5.8 The Financial Bids shall be opened online. The Evaluation Committee will determine whether the submitted Financial bids are complete (i.e. whether they have included cost of all items of the corresponding proposals; if not, then the cost towards such missing items will be considered as NIL, but the bidder shall, however, be required to carry out such obligations without any additional compensation. In case under such circumstances, if NHAI feels that the work cannot be carried out within the overall cost as per the submitted financial bid, such proposals shall be considered non responsive.

⁵ As per the eligibility criteria prescribed, minimum value for x = 1; y=2 and z=3 as the case may be.



- 5.9 The Successful Bidder shall be intimated by NHAI through Letter of Award (LoA). Upon issue of LoA the Successful Bidder shall be required to furnish Letter of Acceptance and Performance Security and other guarantees as prescribed in the RFP document. NHAI shall have the right to get the bank guarantees verified from the respective issuing bank. Upon receipt of verification, the successful bidder shall be invited to sign the contract with NHAI. The format of Contract Agreement is prescribed in the RFP Document.
- 5.10 NHAI reserves the right to reject any bid which is non-responsive and no request for alteration, modification, substitution, or withdrawal shall be entertained by NHAI in respect of such bids.



**PERFORMANCE SECURITY**

- 6.1 Upon issue of a Letter of Award (LoA) by NHAI, the Successful Bidder shall be required to furnish an unconditional and irrevocable Performance Security in the form of a Performance Bank Guarantee (PBG) in the prescribed format ***within a period of 15 days***. The PBG shall be for an amount of 10% of its Total Bid Value quoted in the financial bid and should be in favour of “National Highways Authority of India”, New Delhi. The Performance Security shall be valid for period of seven (7) years. In case the contract is extended, the Service Provider shall extend the validity of PBG appropriately such that it remains valid until one year beyond completion of the contract.
- 6.2 The PBG from following banks shall only be accepted:
- a) State Bank of India or its subsidiaries.
 - b) Any Indian Nationalized Bank.
 - c) IDBI or ICICI Bank.
 - d) A Foreign Bank (issued by a branch outside India) with a counter guarantee from SBI or its subsidiaries or any Indian Nationalized Bank.
 - e) Any Scheduled Commercial Bank approved by RBI having a net worth of not less than 500 Crores as per the latest Annual Report of the Bank. In the case of a Foreign Bank (issued by the branch of India) the net worth in respect of the Indian operations shall only be taken into account.
- 6.3 The acceptance of the PBG shall also be subject to the following condition:
- a) The capital adequacy of the Bank shall not be less than the norms prescribed by RBI.
 - b) The bank guarantee issued by a Cooperative Bank shall not be accepted.
- 6.4 After acceptance of Performance Security by NHAI, the Bid security of the Successful Bidder shall be returned without interest.
- 6.5 In case the difference between the lowest bidder (L1) and the second lowest bidder (L2) is more than 50% of the L2 bidder, then the lowest bidder (successful bidder) shall be required to submit Additional Performance Security in the form of PBG of 10% of the difference between the Bid Value quoted by L2 and L1. The additional performance security in this case shall be required to be submitted by the Successful Bidder to ensure that it shall perform the contractual obligations to the satisfaction of NHAI despite such lower bid value and this additional performance security shall also be treated as performance security for encashment/ forfeiture.

MISCELLANEOUS

- 7.1 This RFP document also includes a format of the Contract Agreement to be executed with the successful bidder for providing stipulated services to NHAI. Bidders are advised to study the RFP document along with its amendment/ addendum carefully. Submission of the bid will be deemed to have been done after careful study and examination of ground realities as well as all the instructions, eligibility norms, terms & conditions, requirements and specifications available in the RFP document with full understanding of its implications. The Bidder is expected to examine carefully all the instructions, conditions of Contract, forms for submitting Technical and Financial Bids and scope of work in the RFP document before submitting their Bids. Failure to comply with all the requirements of RFP document shall be at the Bidder's own risk. Bids, which are not substantially responsive to the requirements of the RFP document, shall be declared non-responsive and shall not be considered for evaluation.
- 7.2 No bidder shall submit more than one bid against this RFP. If more than one bid is received from the same bidder, all such bids shall be summarily rejected.
- 7.3 NHAI will be at liberty to keep the credentials of the bidders submitted by them at bidding stage, in public domain and the same may be uploaded by NHAI on its web site. The bidders shall have no objection if NHAI uploads/ hosts the information pertaining to their credentials as well as of their key personnel.
- 7.4 The bidding process shall be governed by, and construed in accordance with, the laws of India and courts at New Delhi shall have exclusive jurisdiction over all disputes arising under, pursuant to and/or in connection with the bidding process.
- 7.5 Any dispute arising out of this procurement process shall be referred to Society for Affordable Redressal of Disputes (SAROD). The decision of the SAROD in this regard shall be final and binding on the parties.
- 7.6 NHAI, in its sole discretion and without incurring any obligation or liability, reserves the right, at any time, to;
- (i) Suspend and/or cancel the bidding process and/or amend and/or supplement the Bidding Process or modify the dates or other terms and conditions relating thereto;
 - (ii) Consult with any Bidder in order to receive clarification or further information;
 - (iii) Retain any information and/ or evidence submitted to NHAI by, on behalf of, and/ or in relation to any Bidder; and/or;
 - (iv) Independently verify, disqualify, reject and/ or accept any and all submissions or other information and/or evidence submitted by or on behalf of any Bidder.
- 7.7 NHAI is not bound to reply/ respond to any representation/ letter or request for Change in Scope of work, eligibility criteria or any relaxation in respect of the tender conditions. No correspondence will be entertained on this matter.
- 7.8 It shall be deemed that by submitting the Bid, the Bidder agrees and releases NHAI, its employees, agents and advisers, irrevocably, unconditionally, fully and finally from any and all liability for claims, losses, damages, costs, expenses or liabilities in any way related to or arising from the exercise of any rights and/or performance of any obligations hereunder, pursuant hereto and/or in connection with the bidding process and waives, to the



fullest extent permitted by Applicable Law, any and all rights and/ or claims it may have in this respect, whether actual or contingent, whether present or in future.

7.9 Verification and Dis-qualification: NHAI reserves the right to verify all statements, information and documents submitted by the Bidder in response to this RFP and the Bidders shall, when so required by NHAI, make available all such information, evidence and documents as may be necessary for such verification. Any such verification or lack of such verification, by NHAI shall not relieve the Bidders of its obligations or liabilities hereunder nor will it affect any rights of NHAI thereunder.

7.10 NHAI reserves the right to reject any Bid and/ or declare it non-responsive, if:

- (i) At any time, a material misrepresentation is made or uncovered, or
- (ii) The Bidder does not provide, within the time specified by NHAI, the supplemental information sought by NHAI for evaluation of the Bid.

Such misrepresentation/ improper response shall lead to the disqualification of the Bidder. If such disqualification/ rejection occurs after the bids have been opened and the lowest bidder gets dis-qualified/ rejected, then NHAI reserves the right to take any such measure as may be deemed fit in the sole discretion of NHAI including annulment of the Bidding process.

7.11 Amendment to RFP Documents:

- (a) Any modification in the RFP document shall be made by NHAI separately through issue of an Addendum/ Amendment.
- (b) At any time prior to the bid due date, NHAI, may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, modify the conditions specified in the RFP document by an amendment. Any amendment/ addendum thus issued shall be part of the RFP document and shall be communicated by hosting the same on NHAI's web site only and should be taken into consideration by the prospective bidders while preparing their Bids.
- (c) In order to give prospective Bidders reasonable time to take the amendment into account in preparing their bid, NHAI may, at its discretion, extend the bid due date.
- (d) The Bidder must read all the instructions in the RFP and abide by the same accordingly.

7.12 INDEMNITY

The Bidder shall, subject to the provisions of the Contract, indemnify NHAI for any direct loss or damage caused on account of any act/ omission of the bidder.

7.13 PROPRIETARY DATA

All documents and other information provided by NHAI or submitted by a Bidder to NHAI shall remain or become the property of NHAI. Bidders are to treat all information as strictly confidential. NHAI will not return any bid or any information related thereto. All information collected, analysed, processed or in whatever manner provided by the Successful Bidder to NHAI in relation to the services shall be the property of NHAI.

The Service Provider shall not keep any copy of the data/ video with them without prior permission of the NHAI. The Service Provider shall not use any data / video for any purpose other than that permitted by NHAI.

Adequate cyber security measures shall be taken to protect the entire system and data from cyber-attacks and data theft.



7.14 CORRUPT OR FRAUDULENT PRACTICES

NHAI requires Bidder observe the highest standard of ethics during the procurement and execution of the Contract. In pursuance of this policy:

- (a) Defines, for the purposes of this provision, the terms set forth below as follows:
 - (i) “Corrupt Practice” means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in Contract execution;
 - (ii) “Fraudulent Practice” means a misrepresentation of facts in order to influence a procurement process or the execution of a Contract to the detriment of NHAI, and includes collusive practice among Bidders (prior to or after Bid submission) designed to establish Bid prices at artificial non-competitive levels and to deprive NHAI of the benefits of free and open competition;
 - (iii) “Coercive Practice” means impairing or harming, or threatening to impair or harm, directly or indirectly, any person or property to influence any person’s participation or action in the bidding process;
 - (iv) “Undesirable Practice” means (i) Establishing contact with any person connected with or employed or engaged by NHAI with the objective of canvassing, lobbying or in any manner influencing or attempting to influence the bidding process; or (ii) having a Conflict of Interest; and
 - (v) “Restrictive Practice” means forming a cartel or arriving at any understanding or arrangement among Bidders with the objective of restricting or manipulating a full and fair competition in the bidding process.
- (b) will reject a bid if it determines that the Bidder has engaged in corrupt or fraudulent or coercive or undesirable or restrictive practices in competing for the Contract in question;
- (c) will blacklist/ declare a bidder ineligible, either indefinitely or for a stated period of time, to be awarded any Contract by NHAI if it at any time determines that the bidder has engaged in corrupt or fraudulent or coercive or undesirable or restrictive practices in competing for, or in executing, a NHAI Contract.

7.15 Integrity Pact:

Bidder shall comply with the provisions of the Office Memorandum No. 13030/09/2008-Vig. Dated 28.01.2013 issued by NHAI (Copy enclosed) at **Appendix-I**.

Appendix-I

 भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग विभाग)
National Highways Authority of India
(Ministry of Road Transport and Highways)
पी-5 एवं 6, सेक्टर-10, द्वारका, नई दिल्ली-110075
G-5 & 6, Sector-10, Dwarka, New Delhi-110075

दूरभाष / Phone: 91-11-25074100/25074208
फैक्स / Fax: 91-11-25083507 / 25083514

No.13019/8/2009-Vig. dated : 28th January, 2013

Office Memorandum

Sub: Adoption of Integrity Pact (IP) for NHAI Projects-reg.

In suppression of OM No. NHA/CM/C/IP/IEM/2011-12 dated 13.08.2012 and OM of NHA/CM/C/IP/IEM/2011-12 dated 14.08.2012, it has been decided to implement the concept of Integrity Pact in NHAI projects. The Integrity Pact (IP) envisages an agreement between the prospective bidder and the buyers committing the persons/officials of both the parties, not to exercise any corrupt influence on any aspect of the contract. The IP also envisages empanchment of Independent External Monitors (IEM). The IEM may review independently and objectively whether and to what extent parties have complied with their obligations under the pact.

2. NHAI is going to appoint IEM shortly for implementation of the IP in NHAI. MoRT&H vide its letter no. C-13019/8/2009-Vig. dated 18.11.2011 has approved applicability of adoption of IP in NHAI works as mentioned below:

- (i) Civil Works above Rs.100.00 crore
- (ii) Services such as consultancy, engineering etc. above Rs.5.00 crore

3. In this connection, all the officers of NHAI are hereby requested to implement and follow the concept of IP and adopt the same in all future projects of NHAI as scrupulously in works included in para.2 above as per Model Agreements (copy enclosed) for each category. This Model Agreement would be provided to the bidders at NIT/ Pre-bid /Technical bid stage, whichever applicable, with instruction to submit the same after signing it. Contractor/ concessionaire / consultant / bidder would be required to submit this duly signed agreement (signed by the same signatory competent/authorized to sign the relevant contract agreement) along with their Technical Bid/Tender Documents. The representative authorized to sign contract agreement, on behalf of NHAI, would sign the same while signing the contract so that this may be made a part of the contract document and binding for both the parties signing the contract.

4. It is clarified that IP should cover all phases of the contract, i.e. from the stage of Notice Inviting Tender (NIT) / pre-bid stage till the conclusion of the contract, i.e. the final payment or the duration of warranty / guarantee / defect liability / concession period, whichever applicable. The IEM would be, invariably, cited in the NIT. Further, information relating to tender in progress and under finalization would need to be shared with IEM on monthly basis.

contd.2.



5. After implementation of Integrity Pact, NHAI has to send progress/status in the implementation of IP enabling CVC to include the same in their annual report as prescribed in the CVC circular no. 10/5/09 dated 18.05.2009 and subsequent circular no.31/08/10 dated 13.08.2010 (copies enclosed). Further, an internal assessment of the impact of IP shall be carried out periodically by the CVO and reported to the CVC through their report or special report, wherever necessary. In view of this, status of implementation of IP would be reported by all divisions to CVO on monthly basis.

6. All the Divisions engaged in purchase/procurement shall ensure strict compliance of this.

This issues with the approval of Chairman, NHAI.

- Encl: (1) Model Agreement for category (i) works
(2) Model Agreement for category (ii) works
(3) CVC's Circular no. 10/5/09 dt. 18.05.09
(4) CVC's Circular no.31/08/10 dt.13.08.10

To


(B.N.Sahay)
General Manager (CMC)

1. All PIUs/CMUs
2. All ROs
3. All CGMs at HQ
4. All GMs at HQ
5. CVO, NHAI

Copy for information to:

1. PS to Chairman
2. All PS to Members

**INTEGRITY PACT FORMAT**

(To be executed on plain paper and submitted along with Technical Bid. To be signed by the bidder and same signatory competent/ authorized to sign the relevant contract on behalf of NHAI)

RFP No. Dated

This Integrity Pact is made at _____ on this _____ day of _____ 2017

Between

National Highways Authority of India (NHAI), a statutory body constituted under the National Highways Authority of India Act, 1988, which has been entrusted with the responsibility of development, maintenance and management of National Highways having its office at G-5 & 6, Sector – 10, Dwarka, New Delhi, hereinafter referred to as “**The Principal**”, which expression shall unless repugnant to the meaning or contract thereof include its successors and permitted assigns.

And

_____, hereinafter referred to as “**The Bidder/ Contractor/ Service Provider**” and which expression shall unless repugnant to be meaning or context thereof include its successors and permitted assigns.

Preamble

Whereas, the Principal intends to award, under laid down organizational procedures contract/s for The Principal values full Compliance with all relevant laws of the land, rules of land, regulations, economic use of resources and of fairness/ transparency in its relations with its Bidder(s)/ Contractor(s)/ Service Provider(s).

And whereas to meet the purpose aforesaid, both the parties have agreed to enter into this Integrity Pact (hereafter referred to as Integrity Pact) the terms and conditions of which shall also be read as integral part and parcel of the Tender documents and contract between the parties. Now, therefore, in consideration of mutual covenants stipulated in this pact, the parties hereby agree as follows and this pact witnesseth as under:

Article 1- Commitments of the Principal

- (1) The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:
 - (a) No employee of the Principal, personally or through family members, will in connection with the tender for or the execution of a contract, demand, take a promise for or accept for self or third person any material or immaterial benefit which the person is not legally entitled to.
 - (b) The Principal will during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular before and during the tender process provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
 - (c) The Principal will exclude all known prejudiced persons from the process, whose conduct in the past has been of biased nature.
- (2) If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the IPC/PC Act or any other Statutory Acts or if there be a



substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officer and in addition can initiate disciplinary actions as per its internal laid down Rules/ Regulations.

Article 2- Commitments of the Bidder(s)/ Contractor(s)/ Service Provider(s)

The Bidder(s)/ Contractor(s)/ Service Provider(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

- (a) The Bidder(s)/ Contractor(s)/ Service Provider(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
- (b) The Bidder(s)/ Contractor(s)/ Service Provider(s) will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
- (c) The Bidder(s)/ Contractor(s)/ Service Provider(s) will not commit any offence under the relevant IPC/ PC Act and other Statutory Acts; further the Bidder(s)/ Contractor(s)/ Service Provider(s) will not use improperly, for purposes of completion or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
- (d) The Bidder(s)/ Contractor(s)/ Service Provider(s) of foreign origin shall disclose the name and address of the Agents/ representatives in India, if any. Similarly, the Bidder(s)/ Contractor(s)/ Service Provider(s) of Indian Nationality shall furnish the name and address of the foreign principle, if any.
- (e) The Bidder(s)/ Contractor(s)/ Service Provider(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract. He shall also disclose the details of services agreed upon for such payments.
- (f) The Bidder(s)/ Contractor(s)/ Service Provider(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
- (g) The Bidder(s)/ Contractor(s)/ Service Provider(s) will not bring any outside influence through any Govt. bodies/ quarters directly or indirectly on the bidding process in furtherance of his bid.

Article 3- Disqualification from tender process and exclusion from future contracts

- (1) If the Bidder(s)/ Contractor(s)/ Service Provider(s) before award or during execution has committed a transgression through a violation of any provision of Article-2, above or in any other form such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s)/ Service Provider(s) from the tender process.
- (2) If the Bidder(s)/ Contractor(s)/ Service Provider(s) have committed a transgression through a violation of Article-2 such as to put his reliability or credibility into question, the Principal shall be entitled to exclude including blacklist and put on holiday the Bidder(s)/ Contractor(s)/ Service Provider(s) for any future tender/ contract award process. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the Principal taking into consideration the



full facts and circumstances of each case particularly taking into account the number of transgressions, the position of the transgressors within the company hierarchy of the Bidder(s)/ Contractor(s)/ Service Provider(s) and the amount of the damage. The exclusion will be imposed for a minimum of 1 year.

- (3) A transgression is considered to have occurred if the Principal after due consideration of the available evidence concludes that “On the basis of facts available there are no material doubts”.
- (4) The Bidder(s)/ Contractor(s)/ Service Provider(s) with its free consent and without any influence agrees and undertakes to respect and uphold the Principal’s absolute rights to resort to and impose such exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground, including the lack of any hearing before the decision to resort to such exclusion is taken. This undertaking is given freely and after obtaining independent legal advice.
- (5) The decision of the Principal to the effect that a breach of the provisions of this Integrity Pact has been committed by the Bidder/ Contractor/ Service Provider shall be final and binding on the Bidder/ Contractor/ Service Provider.
- (6) On concurrence of any sanctions/ disqualification etc. arising out from violation of integrity pact the Bidder/ Contractor/ Service Provider shall not be entitled for any compensation on this account.
- (7) Subject to full satisfaction of the Principal, the exclusion of the Bidder/ Contractor/ Service Provider could be revoked by the Principal if the Bidder/ Contractor/ Service Provider can prove that he has restored/ recouped the damage caused by him and has installed a suitable corruption prevention system in his organization.

Article 4- Compensation for Damages

- (1) If the Principal has disqualified the Bidder(s) from the tender process prior to the award according to Article 3, the Principal shall be entitled to forfeit the Earnest Money Deposit / Bid Security or demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security apart from any other legal right that may have accrued to the Principal.
- (2) In addition to 1 above, the Principal shall be entitled to take recourse to the relevant provisions of the contract related to Termination of Contract due to Contractor/ Service Provider’s Default. In such case, the Principal shall be entitled to forfeit the Performance Bank Guarantee of the Contractor/ Service Provider and/or demand and recover liquidated and all damages as per the provisions of the Contract Agreement against Termination.

Article 5 - Previous Transgressions

- (1) The Bidder declares that no previous transgressions occurred in the last 3 years immediately before signing of this Integrity Pact with any other Company in any country conforming to the anti-corruption/ Transparency International (TI) approach or with any other Public Sector Enterprise/ Undertaking in India or any Government Department in India that could justify his exclusion from the tender process.
- (2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or action for his exclusion can be taken as mentioned under Article-3 above for transgressions of Article-2 and shall be liable for compensation for damages as per Article-4 above.

**Article 6 - Equal treatment of all Bidder(s)/ Contractor(s)/ Service Provider(s)/ Subcontractor(s)**

- (1) The Bidder(s)/ Contractor(s)/ Service Provider(s) undertake(s) to demand from all sub-contractor(s) a commitment in conformity with this Integrity Pact, and to submit it to the Principal before contract signing.
- (2) The Principal will enter into agreements with identical conditions as this one with all Bidder(s)/ Contractor(s)/ Service Provider(s) and Subcontractor(s).
- (3) The Principal will disqualify from the tender process all Bidders who do not sign this Pact or violate its provisions.

Article 7 - Criminal charges against violating Bidder(s)/ Contractor(s)/ Service Provider(s)/ Sub-contractor(s)

If the Principal obtains knowledge of conduct of a Bidder/ Contractor/ Service Provider or Subcontractor, or of an employee or a representative or an associate of a Bidder/ Contractor/ Service Provider or Subcontractor, which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the same to the Chief Vigilance Officer.

Article 8 - Pact Duration

This Pact begins when both parties have legally signed it. It expires for the Contractor/ Service Provider 12 months after his Defect Liability Period is over or 12 months after his last payment under the contract whichever is later and for all other *unsuccessful* Bidders 6 months after the Contract has been awarded.

If any claim is made/ lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/ determined by Chairman of NHAI.

Article 9 - Other Provisions

- (1) This Pact is subject to Indian Law Place of performance and jurisdiction is the Registered Office of the Principal i.e. New Delhi.
- (2) Changes and supplements as well as termination notices need to be made in writing.
- (3) If the Bidder/ Contractor/ Service Provider is a partnership or a consortium, this pact must be signed by all partners or consortium members.
- (4) Should one or several provisions of this Agreement turn out to be invalid, the remainder of this Agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- (5) Any disputes/ differences arising between the parties with regard to term of this Pact, any action taken by the Principal in accordance with this Pact or any relation thereof shall not be subject to any Arbitration.
- (6) The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

In witness whereof the parties have signed and executed this Pact at the place and date first done mentioned in the presence of following witnesses:

[For & On behalf of the (Principal)]

(Office Seal)

[For & On behalf of the Bidder/ Contractor/
Concessionaire/ Consultant]



Place:-----

Date: _____

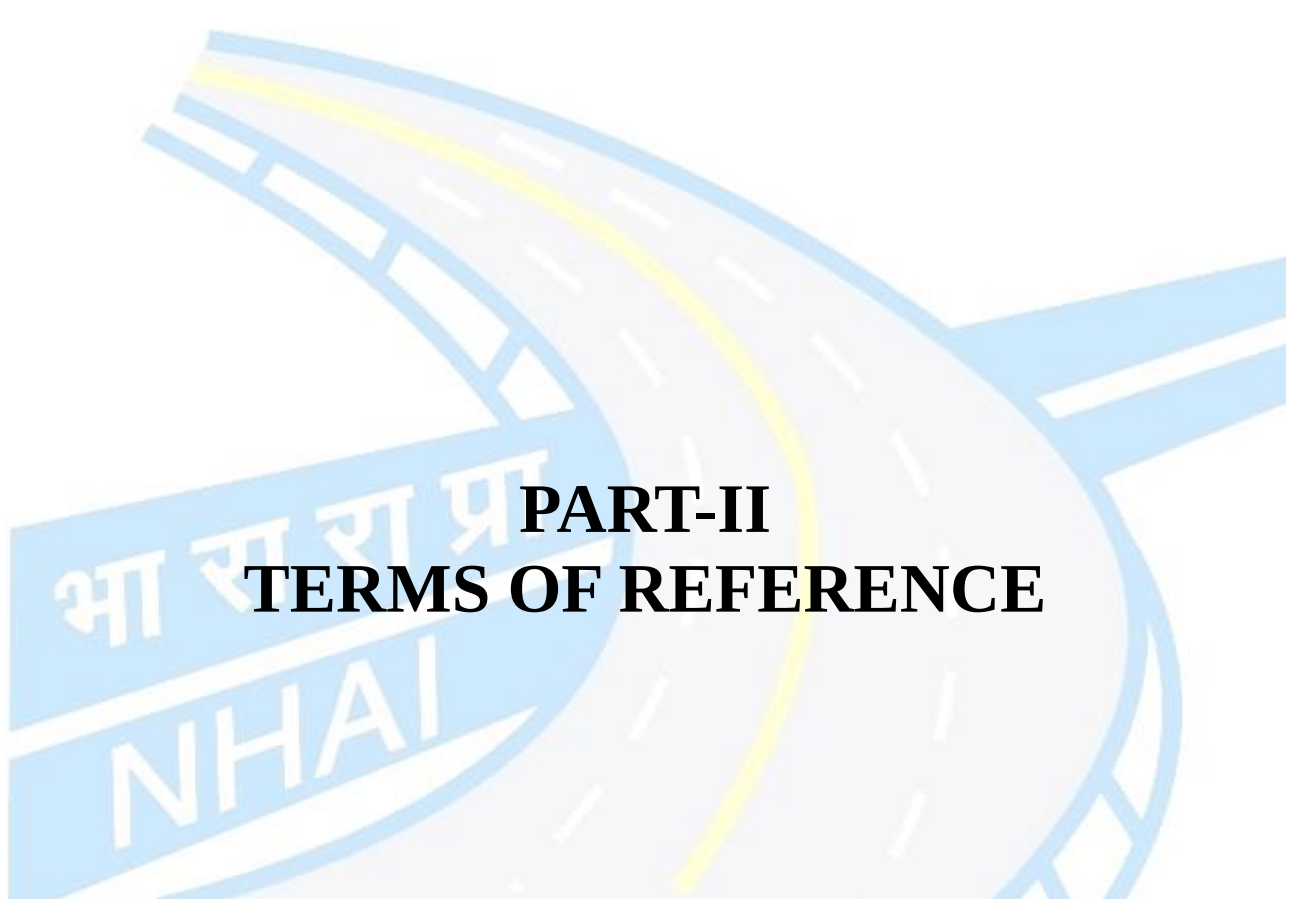
Witness 1:

(Name & Address)

Witness 2:

(Name & Address)





PART-II

TERMS OF REFERENCE



TERMS OF REFERENCE (ToR)

List of Acronyms

APTS	Automatic Power Transfer Switch
ATCC	Automatic Traffic Counter & Classifier
CCC	Command & Control Centre (to be established at NHAI HQ)
CC Unit	Unit of CCC viz. Toll Plazas, RCC, or CCC
DMEP	Domestically Manufactured Electronic Products
Id	Identity
NHAI HQ	National Highways Authority of India Headquarters
NHAI RO	National Highways Authority of India Regional Office
OEM	Original Equipment Manufacturer
PD	NHAI's Project Director at PIU
PoE	Power over Ethernet
PIU	Project Implementation Unit
PROJECT	Command and Control Centre including Video Conference, CCTV Surveillance & Monitoring of Vehicular Congestion on National Highway Toll Plazas
PTZ	Pan Tilt Zoom
RCC	Regional Control Centre (to be established under each RO)
SAN	Storage Area Network
SAT	Site Acceptance Testing
Toll Plaza	User Fee Plaza on National Highways
TVSS	Transient Voltage Surge Suppressor
UPS	Uninterrupted Power supply
VC	Video Conferencing
VOC	Volatile Organic Compounds

1. Background

The work will include Design, Supply, Installation, Testing, Commissioning, Configuration, System Integration, Operations and Maintenance of Command and Control Centre including Video Conferencing, Video based ATCC and Comprehensive CCTV Surveillance & Monitoring of Vehicular Congestion at all NHAI Toll Plazas (approx. 380 at present) from corresponding Regional offices (approx. 22 at present) of NHAI mostly in State capitals and the NHAI HQ in New Delhi.

The project shall be a complete turnkey solution with provision of skilled resources at all locations for operations and shall be offered to NHAI as “**Infrastructure as service model**” The period of engagement shall initially be **six years**. This may be extended for another two year subject to satisfactory services and continued requirement of NHAI.

This RFP describes functional requirements envisaged by NHAI. In addition, the minimum technical specifications have been prescribed in this document, wherever indispensable. The Service Provider is responsible for the design of complete project and the system architecture as per the best industry practices, to deliver state-of-the-art solution to NHAI. Any consideration affecting safety, security, redundancy, and compliance to stipulated provision prescribed by government authorities is the responsibility of the Service Provider and shall be duly taken care of to ensure adherence to minimum functional requirement stipulated in this document as well as the SLA parameters.

Broad objective of the project is as under:

- a. **24X7 real-time Administrative Surveillance:** On-line visual monitoring of traffic congestion and Administrative Surveillance at each NHAI Toll Plaza. Video based Automatic Traffic Counting & Classification (ATCC) in each direction of traffic at each toll plaza.
- b. **Incident Detection System:** To facilitate NHAI HQ and RO intervention to ensure immediate mitigation of traffic congestion at the affected toll plaza. System to generate and maintain the list of all alerts with date & time stamp including corresponding static image that caused such alert etc. The system shall also be able to capture and generate reports how long it took to resolve the same. Detection of stopped vehicle/queue in any toll lane / poor visibility due to inadequate lighting/fog/smoke/dust etc.
- c. **Network Management System (NMS):** Monitoring uptime of entire system (including each peripheral and network connectivity) using Network Management System. This will also include poor/low video quality, no video signal, communication network issues or bandwidth etc.
- d. **Video Conferencing (VC):** Multi-party Video conferencing between Control Centre(s) at NHAI, HQ, Regional Office and Toll Plazas through provision of complete VC set up and VC client (software based) on Tab/Mobile/Laptop of each Project Director.
- e. **Data storage / retention and MPLS connectivity**

The overall system schematic is shown in Figure 1 below.

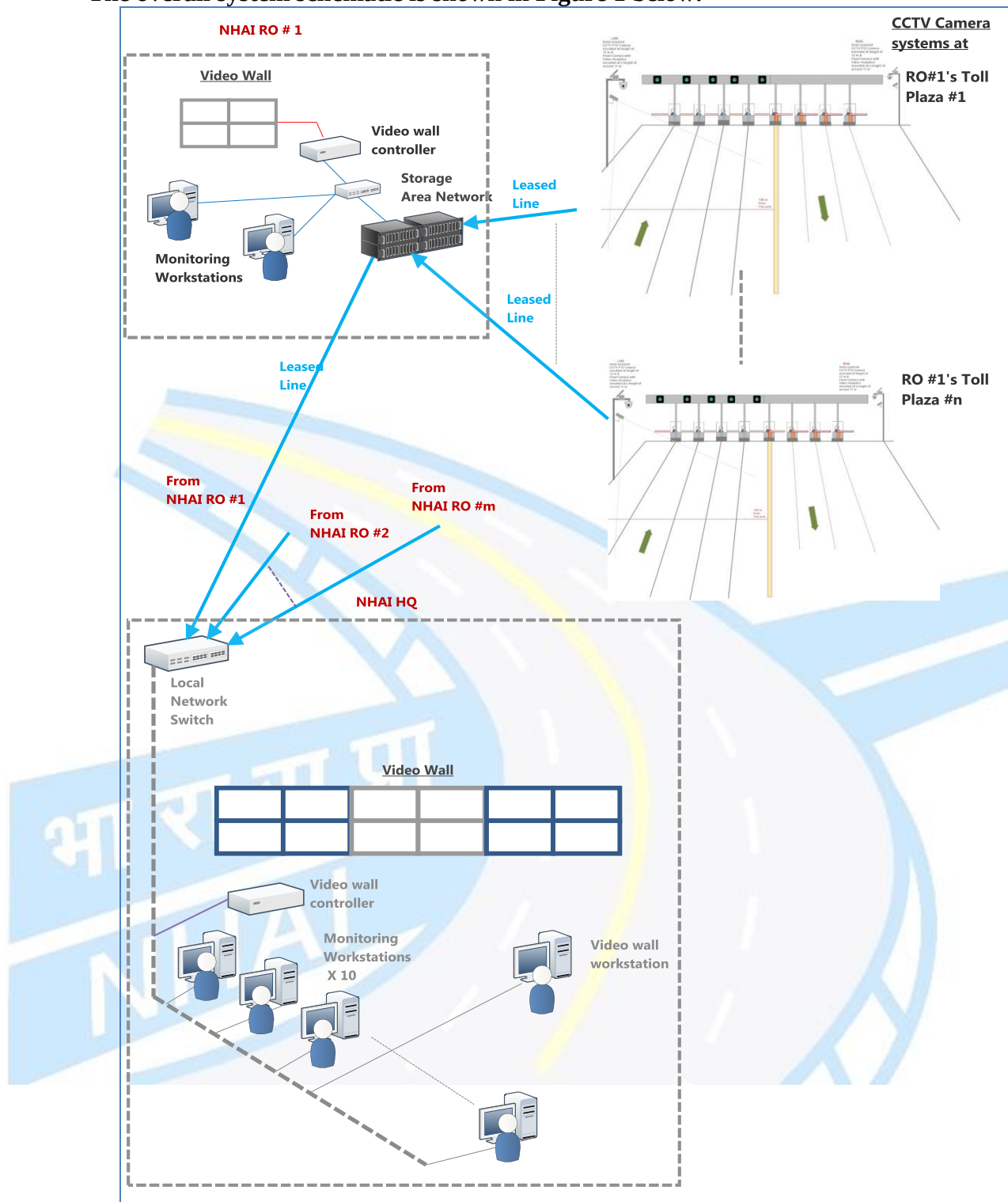


Figure 1: Schematic of the proposed system

2. Coverage

Around 380 Toll Plazas on various National Highways in the country and around 22 Regional offices of NHA mostly in the State capital and Head office at Dwarka, Sector 10, New Delhi shall be covered under the scope of services. The proposed system includes a pair of CCTV Cameras – one of the PTZ-type and one of the fixed-type to monitor the toll plaza congestion in each traffic direction at all Toll Plazas. Thus, each toll plaza will have two such pairs of CCTV Cameras dedicated to both traffic directions. The PTZ camera and the fixed camera, would be suitably mounted on a pole and shall be located in a manner to

capture the ‘arriving’ side of traffic in each direction as shown in Figure 2. Toll plazas with 16 and more number of toll lanes/toll booths will have 2 fixed cameras in each direction as explained below.

The Toll Plazas shall be further divided into two categories, on the basis of number of toll lanes at the toll plazas.

Type-I: Toll Plaza with 16 and more number of toll lanes

Type-II: Toll Plaza with less than 16 number of toll lanes

Type-I toll plazas will have two fixed cameras in each direction, one mounted along with PTZ camera on the pole installed in shoulder and second fixed camera mounted on a separate pole installed in the median or the island of the center most toll lane in a manner to capture the arriving side of traffic in each direction.

Toll Plaza type	No. of Toll lanes	No. PTZ camera per direction	No. of Fixed cameras per direction	Location of PTZ and Fixed camera pair in each direction	Location of 2 nd Fixed Camera in each direction
Type-I	16 and more	1	2	On same pole installed in Shoulder	On pole installed in Median or island of center most toll lane
Type-II	Less than 16	1	1	On same pole installed in Shoulder	NA

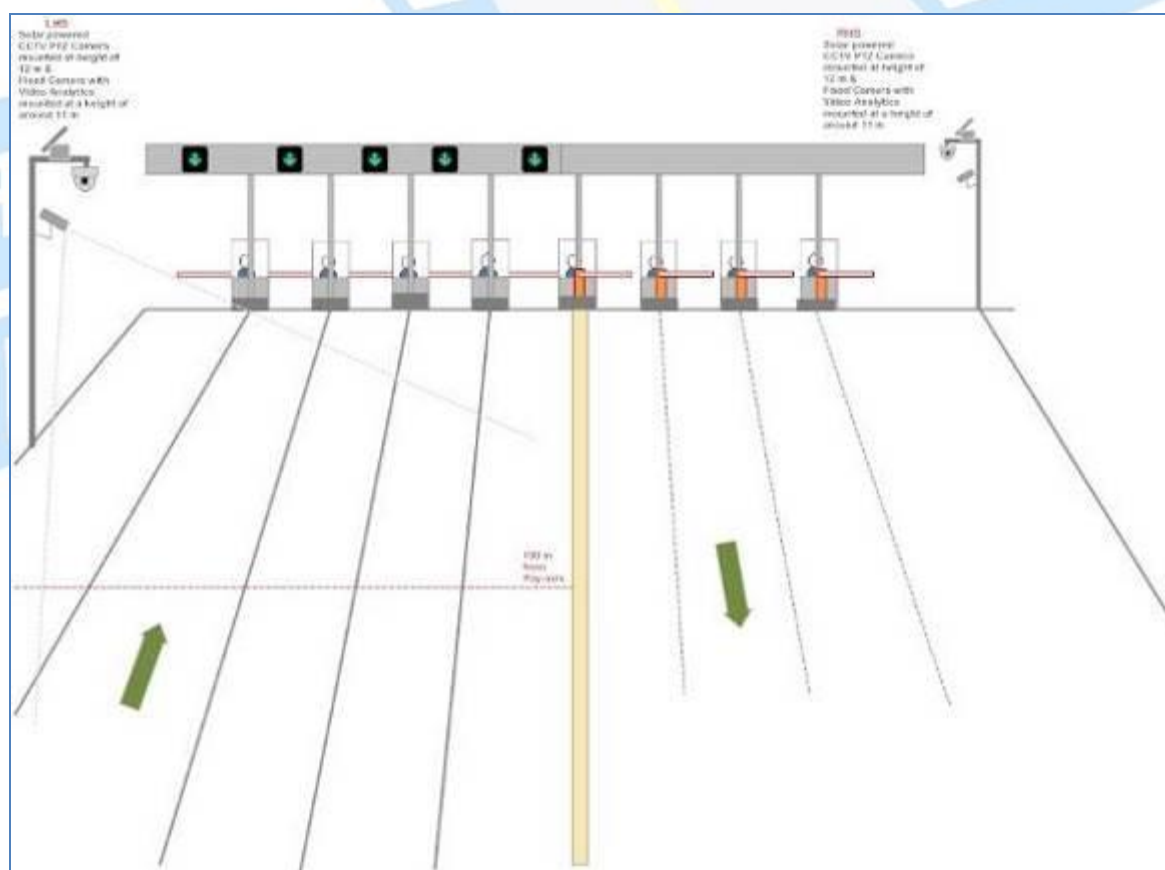


Figure 2: Equipment Location at the Toll Plaza (Type-II)



3. Scope of Work

- (i) The work will include Design, Supply, Installation, Testing, Commissioning, Configuration, System Integration, Operations and Maintenance of Command and Control Centre including Video Conferencing, Comprehensive CCTV Surveillance & Monitoring of Vehicular Congestion on Toll Plaza along the NHs and Video based ATCC. The project shall be a complete turnkey solution with provision of skilled resources at all locations for operations and shall be offered to NHAI as **“Infrastructure as service model”**.
- (ii) The 24/7 live video streams from all the cameras at all toll plazas will be transferred on real time basis through dedicated 8 MBPS MPLS link to the Regional Control Centre (RCC) at corresponding Regional Office (RO) of NHAI and stored there in a Storage based video servers installed therein. The video stream captured and displayed at any location under this project shall be authenticated through Digital Watermarking containing NHAI logo. The purpose of Digital Watermarking is to ensure following:
 - Copyright protection
 - Source tracking
 - Broadcast monitoring
 - Video authentication
- (iii) While the default status of PTZ camera will be patrolling mode, it will be used for general monitoring of the traffic congestion situation by the concerned operator(s), the fixed camera with video analytics will be used to automatically detect and generate alerts when the queue length in any of the toll lanes exceeds 100 m.
- (iv) The monitoring of traffic congestion and Automatic Traffic counting & classification (ATCC) at all Toll Plazas, country-wide, will be performed using a series of all-in-one workstations at the respective ROs, and a Video wall/graphic display system at Control Centre (s) which is envisaged at two levels i.e (i) RCC i.e. Regional Control Centre under respective Regional Office of NHAI and (ii) CCC i.e. Command & Control Centre at NHAI HQ, New Delhi. The live video will also be displayed in the workstation at the toll plazas. The system should also support video conference facility between these three nodal points i.e. Toll Plazas, RCC and CCC as well as project execution sites on NHs through Tab/ Laptop (S/W) based VC Client.
- (v) Services shall be provided for a period of 5 years from the date of Site Acceptance Testing (SAT) of all locations covered under various phases of project envisaged under the Scope of Work. During the period of service contract, the entire equipment and systems shall remain property of the Service Provider who will maintain and operate them as well as maintain adequate insurance cover to safeguard against any damage/ theft/ fire/ vandalism etc.
- (vi) After completion of the contract, the Service Provider may take away all his hardware and software on as-is-where-is condition. However, handover all the data/ video etc. to NHAI in accordance with the data retention schedule. The Service Provider shall not keep a copy of any data/ video with him.
- (vii) NHAI will pay fixed L.S. charges in accordance to the number of locations where the services are hired from Service Provider.
- (viii) NHAI may get the audit done through a third party appointed by it to ascertain adherence to the terms and conditions as well as compliance to Service Level Agreement Conditions. The Service Provider shall provide full access to the systems and equipment and ensure successful conduct of audit.



- (ix) NHAI reserves the right to utilize the Equipment which Service Provider shall provide as part of this RFP like Networking – Routers, Switches, Video Walls, NMS, Command and Control system, storage, for any other requirements/future projects without any obligation or cost to NHAI as well as the Service Provider, without compromising the requirement to be met by that equipment as per this ToR.

4. Key Deliverables

a. 24X7 real-time Administrative Surveillance:

- (i) 24X7 real-time on-line visual monitoring of traffic congestion and Administrative Surveillance at each NHAI Toll Plaza from the RCC at corresponding NHAI RO and CCC at NHAI HQ through PTZ Cameras.
- (ii) Generation, automated communication and display of congestion-related automated alerts from each toll plaza to the RCC of corresponding NHAI RO and CCC at NHAI HQ using fixed cameras.
- (iii) Video based Automatic Traffic Counting & Classification (ATCC) in each direction of traffic at each toll plaza using the same fixed cameras and communicating / reporting real-time traffic count & classification to the RCC of concerned NHAI RO on real-time basis.

b. Incident Detection System:

- (i) To facilitate NHAI HQ and RO intervention to ensure immediate mitigation of traffic congestion at the affected toll plaza(s) based on the above input and in line with the existing directives of NHAI on maximum allowable queue length at Toll Plazas.
- (ii) System to generate and maintain the list of all alerts with date & time stamp including corresponding static image that caused such alert etc. received from video analytics module of fixed camera for monitoring by control room operators/staff viz-a-viz present status (to verify whether resolved or pending). The system shall also be able to capture and generate reports how long it took to resolve the same. Reporting periodicity and report content shall be customized under operations stage.
- (iii) Detection of stopped vehicle/queue in any toll lane exceeds 100 meters (from the pay-axis) for a period of 10 seconds or above.
- (iv) Detection of poor visibility due to inadequate lighting/fog/smoke/dust etc.

c. Network Management System (NMS): Monitoring uptime of entire system (including each peripheral and network connectivity) using Network Monitoring Tool at supervisor workstation at each level i.e. Toll Plaza, RCC and CCC, including generation of system alerts /reports on system downtime for SLA monitoring/compliance. This will also include poor/low video quality, no video signal, communication network issues or bandwidth etc. Entire process of capturing downtime, reporting, escalating till resolution should be enabled within the system itself like standard CRM practices.

d. Video Conferencing (VC): Multi-party Video conferencing between Control Centre(s) at NHAI, HQ, Regional Office and Toll Plazas through provision of complete VC set up involving

- (i) Integrated VC endpoint (hardware based): 23” touch screen with in-built camera cum document reader and microphone on toll plaza operator desk at each toll plaza site.
- (ii) VC client (software based) on Tab/Mobile/Laptop of each Project Director. This will be software based VC application to be installed on the existing Tab/ Mobile/ Laptop of Project Directors (PDs). There are about 125 PDs at present.
- (iii) VC Setup (hardware based) with required equipment/ hardware/ software at Regional Control Centre at each Regional Office and
- (iv) MCU and VC Setup (hardware based) with required equipment/ hardware/ software at Command and Control Centre, NHAI, HQ.

e. Data storage / retention:

- (i) CCTV Video feed on Storage at each RCC for period of 90 days with facility to overwrite on first-in-first-out basis on every consequent day. Adequate backup at each RCC for data recovery in case of any failure to be provisioned.
- (ii) Video clipping of incidents captured / detected by the incident management software shall require further analysis at RCC and CCC and enforcement support. These will be stored separately on storage for a period of five years.
- (iii) For video conference proceeding, recordings will be stored for a period of three months in MCU. All VC sessions must be recorded. Estimated minimum VC hours shall be:
 - (a) Routine / Need Basis- 2 Hours / day per RCC (between toll plaza and concerned RO);
 - (b) Weekly Review from CCC at NHAI HQ - 6 Hours / week (between HQ and all ROs);
 - (c) Monthly Senior Officers Meeting (SOM) from CCC - 8 Hours / month (between HQ and all ROs).

f. Connectivity for data Transfer: For data transfer from toll plaza to RCC at concerned RO & CCC at HQ,

f.1 NHAI shall provide Bandwidth connectivity as under:

- (i) 3G/4G connectivity as available for VC client on Tab/Mobile/Laptop with PDs
- (ii) 100 MBPS MPLS link at RCC under each Regional Offices,
- (iii) 1 GBPS MPLS link at CCC under NHAI HQ, New Delhi,

f.2 The Service Provider shall ensure MPLS connectivity of 8 MBPS dedicated from each toll plaza location to the RCC of concerned Regional Office shall be provided by the Service Provider. The last mile connectivity could be on any medium OFC/ RF / VSAT / Copper etc. OR a combination thereof. The MPLS link shall be in the name of Service Provider, who will indemnify NHAI against any liability in this regard. The service provider shall take written approval of NHAI before procuring MPLS link and shall share the terms and conditions to be agreed between service provider and the ISP. Such approval shall be part of the approval of detailed system design.

g. Skilled Resources for manning the Control Centres: The Service Provider shall form a multi-disciplinary team for undertaking this assignment. The details of the required manpower to be deployed on full time basis (24x7) at various control centres are prescribed Appendix B to ToR. These resources shall be responsible for entire operations.

5. System Operations

The system will be monitored round-the-clock from the CCC at NHAI HQ by a team of operators on individual workstations with each workstation being dedicated to a set of toll plazas. In addition, the CCC at the NHAI HQ will have a Graphic Display system split into 3 logical video walls each with a one-third element configuration as shown in figure 3 below.

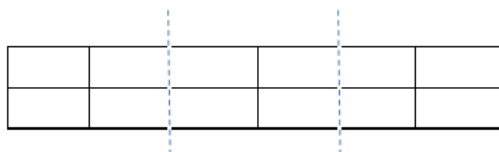


Figure 3: Graphics Display/Video wall composition at the CCC, NHAI HQ

While Logical Video walls # 1 and # 3 will sequence images from each Toll Plaza in each of its 4 elements, the Logical Video wall # 2 will be used to zoom any of the images / video streams from any toll plaza for closer examination and analysis. A facility to access archives (by date, time & Toll Plaza Identity) of video streams stored in the respective storage devices at each RCC will also display the same on Logical Video wall # 2. Also, any traffic congestion alert generated by the video analytics module of any fixed camera, will also be popped up on Logical Video wall # 2.

Video stream images from Toll Plazas will also be displayed on individual workstations located in the control room. For this purpose, each workstation will be assigned a specific set of toll plazas out of the total set of toll plazas.

The Graphic Display shall enable to show multiple screens at a time and the number of screens on the display can be flexible as necessary. The Service Provider shall provide a latest technology based Graphic Display that should not have end of life for at least next five (5) years. The graphic display shall be made up of several units of high quality cubes attached together without rim, and visible from the front.

6. System details

6.1 Toll Plaza system

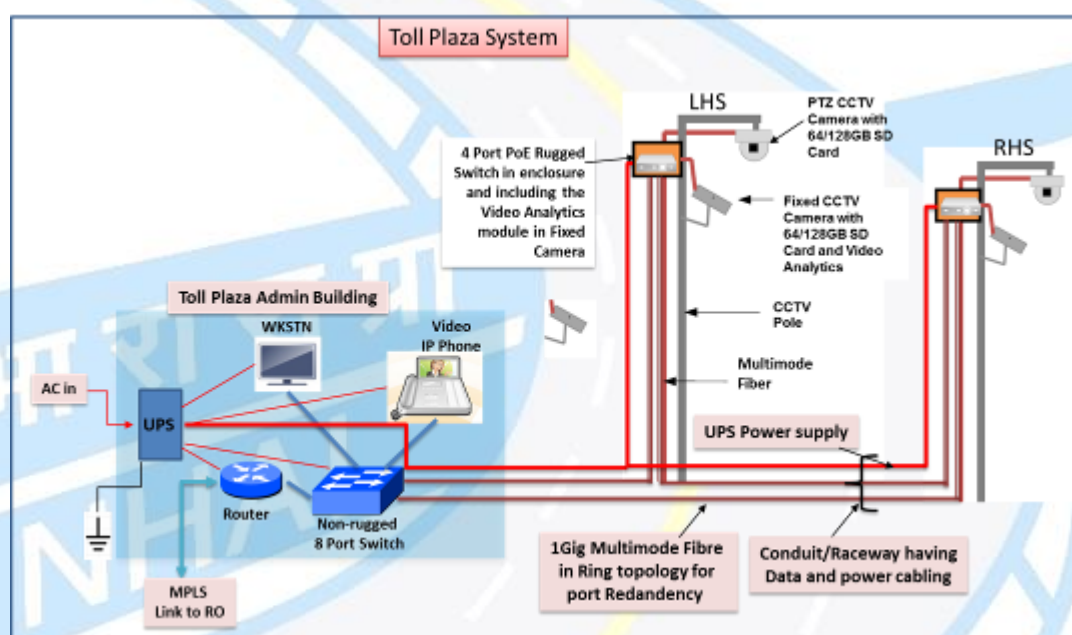


Figure 4: Toll Plaza system and equipment (for reference only)

A schematic of the toll plaza system is shown in figure 4 above. The PTZ camera and the Fixed camera are installed on the same pole and are located such that they are effectively able to capture images of the arriving traffic, While the PTZ camera can be used by the NHAI HQ and RO control rooms to perform a general visual monitoring of the arriving traffic including various relevant places of the toll plaza, the fixed camera has the specific purpose of detecting automatically any violation of queue length with reference to the prevailing NHAI directive. Type-I toll plazas i.e. toll plaza with 16 or more toll lanes, will have two fixed cameras in each direction, one mounted along with PTZ camera on the pole installed in shoulder and second fixed camera mounted on a separate pole installed in the median or the island of the center lane in a manner to capture the arriving side of traffic in each direction.

Connectivity at toll plaza shall only be done using 1 Gig multi-mode optical fiber cable (OFC) in ring topology for port redundancy. The cable shall be laid in two separate HDPE ducts.

The live feed of all the four/six cameras shall be display 24x7 on the 22” LED backlit monitors of All-in-one workstations installed in the Control Room/CCTV Room of the Toll Plaza. The 23” display of the Integrated Video Conferencing (VC) / Video Endpoint shall also be connected to the all-in-one workstation through HDMI port and will be utilized as the secondary display/monitor of the toll plaza workstation. Each Monitor will display the video streams of one direction. During VC, the video streams of all 4/6 cameras shall be displayed on the primary monitor of all-in-one workstation.

6.1.1 Electronics/ Hardware for Toll Plaza

1. PTZ camera with 64/128 GB SD card for local storage, 2 Nos.
2. Fixed Camera with video analytics module and 64/128 GB SD card for local storage, 2/4 Nos.
3. Non-rugged 8-Port Switch with 2 SFP uplink ports, 1 Nos.
4. 4-Port PoE Rugged Switch with additional 2 SFP uplink ports (installed in enclosure mounted on camera pole), 2/4 Nos.
5. PLB HDPE Conduit (Telecom grade) and shielded 1 Gig Multimode OFC Cable (in ring topology for port redundancy) with accessories, as required for each toll plaza, typical length – approx. 200 m (Type-II plazas) to 300 m (Type-I plazas) in each direction
6. Router to connect to the 8 Mbps MPLS link, 1 Nos.
7. All-in-one workstations with 22” LED backlit display/Monitor, 1 No.
8. Biometric finger print reader (for Attendance management of the O&M and Authority’s Engineer staff), 1 No.
9. Integrated Video Conferencing (VC): high end video endpoint of 23 inches or higher size touch screen HD display which support at least 720p resolution, at have inbuilt document reader camera of least 2 megapixel. Integrated Video phone/Endpoint with Camera, Codec, Wi-fi connectivity, HiFi speakers, microphones, HDMI port for input from PC (i.e. all-in-one workstation of toll plaza), all built-in as a single unit from the OEM. - 1 Nos.
10. Uninterrupted Power Supply (UPS) system adequate to provide a minimum 4 hour power back-up to the above system including a battery charge controller and battery bank.
11. All other accessories for the power supply system (including surge suppressors), network surge protection device (SPD) and data cables (including the networking system) as well as those required for the installation of the above system.
12. Training to NHAI staff where applicable/ required by the NHAI officials.

6.2 Technical and functional requirements for the ATCC System

ATCC System: The bidder shall deploy ATCC with Video based systems using the same fixed camera(s) installed for incident management. The details of the fixed camera are separately explained in this document. The traffic data be authenticated through video based ATCC system on any suitable software module. The traffic count of ATCC to ensure following accuracy levels:

- | | |
|--------------------------------|-------------------|
| (i) Classification of vehicles | : better than 95% |
| (ii) Counting of vehicles | : better than 98% |

For interiors and furnishing concerning work stations at toll plaza kindly refer Appendix D to ToR

6.3 Regional Office Control Centre (RCC) system

24 ROs are divided into 3 categories, based on the number of Toll Plazas under their jurisdiction.

- | | |
|---------------------------------------|----------|
| (a) Type-1 (20 or above toll plazas) | – 8 nos. |
| (b) Type-2 (10 to 19 toll plazas) | – 6 nos. |
| (c) Type-3 (less than 10 toll plazas) | – 8 nos. |

Broadly the system will include the following components as shown in figure 5 below.

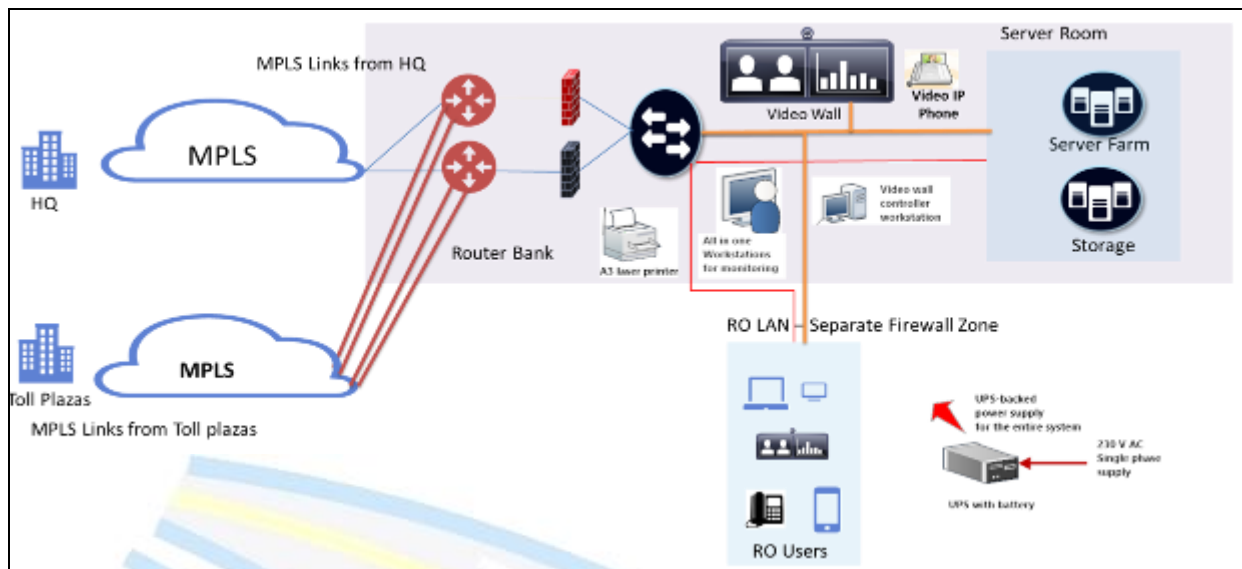


Figure 5: Monitoring System at the RCC

6.3.1 Electronics/ Hardware for RCC:

1. One nos. Laser DLP video wall of diagonal cubes of suitable size in a 2x2 configuration so that the size of graphics display of a minimum size of 2.2m x 1.25 m but not 3 meters X 1.75 meters and depth not exceeding 700 mm, with controller and wall management software for Type 1 & 2 ROs and in 2x1 configuration with minimum size of 2.2 m x 0.6m but not exceeding 3 meters X 0.8 meters for Type 3 ROs.
2. Sufficient Storage for storing video streams from all CCTV PTZ and fixed cameras located in the Toll plazas for congestion monitoring and video analytics on 24/7 basis for a minimum period of 90 days.
3. Application Server, VMS/video server, video analytics server, etc. as applicable as per the solution design of the Service Provider.
4. Adequate bank of routers to connect the system to the MPLS from individual toll plazas as applicable, as per the solution design.
5. Routers, switches, and other networking components.
6. Security solution and next generation firewall.
7. All-in-one workstations with 22" LED backlit display/Monitor for CCTV monitoring and control as well as for displaying the congestion alert events coming from the toll plazas, 2 Nos.
8. Biometric finger print reader (for Attendance management of the O&M and Authority's Engineer staff), 1 Nos.
9. Video wall controller workstation with associated software for monitoring and control, 1 Nos.
10. VMS -Video Management System for monitoring any of the cameras located at the Toll Plazas connected with the RCC to execute on the above workstations and meeting all relevant functional requirements included in this document.
11. High Speed A4 color Laser Network Printer⁶ and Copier with print speed of minimum 20 ppm and auto duplex printing (both side printing), 1 Nos.
12. Integrated Video Conferencing (VC) Solution.
13. IP phones - 2 nos. Each (1 Video & 1 basic IP Phones)

⁶ Recurring expenditure on consumption of cartridge of printer and copier during operations/ service period shall be the responsibility of the service provider.

14. All-in-one Workstation with 22" Touch Screen LED backlit monitor for Conference desk (roll in roll out mechanism) - 1 Nos.
15. Conduit and Cable with accessories for the above system
16. UPS system with at least 4-hour back-up for the complete RCC system.
17. All other accessories for the power supply system & data cables (including the networking system) as well as those required for the installation of the above system.
18. Training to NHAI staff where applicable/ required by the NHAI officials.

The control center facility in each RO will also be used in the same manner as that of the control and command center in the NHAI HQ, however with the following differences:

- a) The Video wall will have suitable logical partitions for monitoring as well as popping up alerts and Video Conferencing (VC) with HQ and Toll Plazas. During VC, the participant shall be able to utilize the whole video wall or a portion as required. The participant shall also be able to share any presentation/ document/ drawing with the CCC, HQ for review/approval by the HQ officials.

Approximate floor area of RCC will be around 450 - 500 sq feet. for interiors and furnishing concerning RCC at Regional Office kindly refer Appendix E to ToR

6.4 Command and control center (CCC) system at Head Quarter (HQ)

Broadly the system will include the following components. A schematic of the system is shown in Figure 6 below.

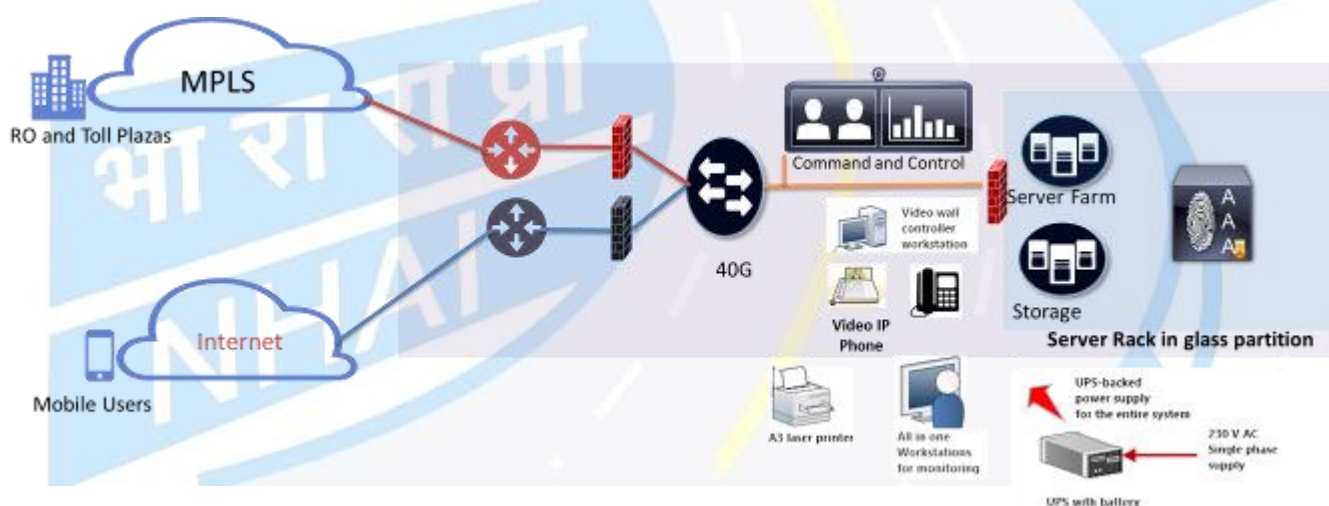


Figure 6: Monitoring system at CCC, NHAI HQ

6.4.1 Functional requirement for Command and Control Centre Software at HQ:

- a) CCC Software should support Maps, Customized content builder, Open UI, Zoom-able interface, Direct control of camera/device from Single UI, Collaboration, Multi-display, Concurrent view of 50+ videos in one display at presentation layer.
- b) CCC Software should support Data Processing with Correlation, Dynamic Topology Generator, Reporting, Workflow, Interfaces to other system, Rules engine, Alert / Threshold, Metric / Health and Data Analytics.
- c) Video Processing module should support for technology to transmit pixels/resolution from RO as required at the HQ to save WAN Bandwidth, Adaptive Streaming, and Video Analytics.



- d) SOP should help the operator to take action for the incident and notify through SMS or e-mail to the concerned person for taking immediate action.
- e) Should Integrate with Communication system such as SMS gateway, Call Manager/Exchange server, email server and other systems for configuring as per SOP.
- f) Capable of using 1/4th of bandwidth specified in HD camera during video transmission without loss of quality from RO to HQ. Should use dynamic channel coverage specifically for video stream function for efficient bandwidth usage for multiple Remote Control center.
- g) Software should support visual integration of maps with video and data displays up to 400 channels simultaneously.
- h) System should support direct access only via SSL-VPN.
- i) In case of multiple events triggered by different devices like sensors and cameras, it should be possible to do the co-relation of such concurrent inputs from different sources to undertake more focused analytics / logs.
- j) Software should be adaptable to the emerging needs of larger Internet of Things (IoT) solution for Expressways/ Highways/ smart Toll plazas. Proposed software should have minimum one deployment/ R&D center in India.
- k) The Service Provider shall ensure that the CCC software provides Super Admin access to NHAI HQ to take urgent action upon any emergency situation by way of immediately stopping video streaming / isolate such location from network to address safety and security of the Nation / public interest.

6.4.2 Electronics/ Hardware for HQ:

1. One nos. Laser DLP video wall of diagonal cubes of suitable size in a Service Provider specified configuration so that the size of graphics display is 6 meters X 1.75 meters ($\pm 10\%$) with graphics controller and wall management software. The Graphic Display shall enable to show bezel free multiple screens at a time and the number of screens on the display can be flexible as necessary. The Service Provider shall provide a latest technology based Graphic Display that should not have end of life for at least next 5 years. The graphic display shall be made up of several units of high quality display panels attached together without rim, and visible from the front.
1. Routers, Core Switches, Network switch (es) and other network components, as required.
2. Security solution and next generation firewall
3. All-in-one workstations with 22" LED backlit display/Monitor for CCTV monitoring and control as well as for displaying the congestion alert events coming from the toll plazas for operators, 3 Nos
4. Biometric finger print reader (for Attendance management of the O&M and Authority's Engineer staff), 1 No.
5. All-in-one workstations with 22" LED backlit display/Monitor for Supervisor, 1 No.
6. Video wall controller workstation with associated software for monitoring and control, 1 No
7. Application server including prescribed storage for event and report storage, Video server, NMS server, MCU server, AAA Server as required.
8. VMS -Video Management System for monitoring any of the cameras located in the Toll Plazas, to execute on the above application server & workstations and meeting all relevant functional requirements included in this document.
9. High Speed A3 color Laser Network Printer⁷ and Copier with print speed of minimum 20 ppm and auto duplex printing (both side printing) with suitable table, 1 No.
10. Integrated Video Conferencing (VC) Solution.
11. IP phones - 3 nos. Each (1 Video & 2 basic IP Phones)

⁷ Recurring expenditure on consumption of cartridge of printer and copier during operations/ service period shall be the responsibility of the service provider.



12. All-in-one Workstation with 22" Touch Screen LED backlit monitor for Conference desk (roll in roll out mechanism) - 3 Nos.
13. Conduit and Cable with accessories for the above system
14. All other accessories for the power supply system & data cables (including the networking system) as well as those required for the installation of the above system.
15. Training to NHAI staff on system operation, as applicable or required by the NHAI officials.

Approximate floor area of CCC will be around 1200-1250 sq feet. For interiors and furnishing concerning CCC at Head Office kindly refer Appendix F to ToR

6.5 Video Storage

The Storage shall be provided for at the Regional office (RO) Level. The system should be capable to store CCTV Video feed for period of 90 days as described under section 7.4, with facility to overwrite on first-in-first out basis on every consequent day thereafter.

7. Functional specifications of main system components

7.1 PTZ CCTV Cameras

- a. The System shall provide an online display of video images.
- b. Proposed CCTV system shall follow an open standard and follow an IP based network centric architecture to provide a high-speed system implementation for best performance.
- c. Video streams / footages shall have been compressed using H.264 (MPEG 4 part 10/AVC) standard prior to recording.
- d. System shall use only IP cameras it should be UTP ready. The compressed video shall be streamed over the IP network.
- e. The recording resolution and frame rate for each camera shall be user programmable.
- f. Surveillance CCTV cameras shall be Power-over-Ethernet (PoE) enabled. No separate cable shall be required to provide power to the surveillance CCTV Cameras.
- g. The video resolution should be configurable between the camera's maximum resolution (D1 i.e. 720p or better) @ 25fps to CIF @ 25 fps or at lower frame rate per camera at the discretion of the user.
- h. PTZ cameras shall support the feature of pre-programmed tours for easy customization to cover specific points of interest in a predetermined pattern.
- i. The system shall be protected against any damage due to power supply fluctuations, transients and surges.

7.2 Fixed CCTV Cameras with Video Analytics Module

- a. The system shall include a pole colour CCTV Camera connected to a co-located Video Analytic module that can signal a traffic congestion alert by detecting whether any of the Toll lane queues have exceeded the 100m location (from the pay-axis) incidents based on video analytics and trigger alarms on detection. The 100m location on the CCTV Image shall be user defined / configurable.
- b. The Cameras shall be mounted at a height of at least 11 m above the road surface level.
- c. The system shall automatically detect the following incidents using video analytics to generate alerts at the NHAI HQ and /or the concerned NHAI RO.:
 - a) Stopped vehicle queue in any of the toll lanes exceeding 100 m (from the pay-axis) for a time period of at least 10 seconds.
 - b) Poor visibility due to fog / smoke / dust
 - c) Poor visibility due to inadequate lighting at night, dawn & dusk.



- d. While generating the above alerts the video analytic module / camera shall also send the corresponding static image that caused the alert.
- e. In addition to the above it shall also provide following alarms:
 - a) Video quality bad / low
 - b) No video signal
 - c) Communication problem
- f. In the event of communication problem with the RO the alarms shall be saved on the local field electronic module. The memory shall be adequate to store up to a minimum of 255 alerts.
- g. The system shall be protected against any damage due to power supply fluctuations, transients and surges.

7.3 Video Management System at the NHAI HQ and RO

The Video Management system shall enable, provide and support the following at the NHAI HQ

- a. Operator selection of any PTZ CCTV Camera at any of the connected Toll Plazas and automatically display its Video stream image, on-line, on the central logical Video wall (#2) in the NHAI HQ control room. This function shall be enabled for both on-line images as well as video streams archived on the storage at each RO. Such archived video streams shall be accessible with an RO Id, Toll Plaza Id as well as date and time.
- b. Video streams shall have a minimum resolution of 720p and shall be displayed at a rate of 15 frames per second (minimum).
- c. Allowing the Operator on the Video Wall workstation to Pan, Tilt and Zoom the above image. Further, the Operator shall be allowed to bring up the above image on any of the 3 logical Video wall or occupy all or partial Graphic Display.
- d. Automatically select, as per a pre-programmed sequence, and display on-line video stream images simultaneously from PTZ CCTV cameras of 12 ROs in each of the logical partition of logical Video walls #1 and #2. Each such video stream image shall be held on the Video wall partition for a period of 30 seconds. This function shall be executed simultaneously with the functions described in a., and b., above without the introduction of any additional delay / latency.
- e. Display (Pop-up) of alerts of Toll Plaza congestion, generated and received from the video Analytics modules of the Fixed CCTV Cameras along with the static images of that caused the alerts. The alert messages shall be suitably over-written on the image itself without affecting the image clarity.
- f. The system shall also generate and maintain a list of toll congestion alerts received from the above video analytics modules for viewing by the control room personnel along with history of creation and the present status (live or resolved) and shall be capable of representing the statistics graphically in the form of pie-charts, bar charts etc.
- g. Functions described under a, b, and e above shall also be made available on the workstations located in the NHAI HQ control room, for the toll plazas pre-assigned / mapped to the concerned workstation.
- h. The system shall provide a facility to generate reports of various Toll Plaza congestion events sorted, as a minimum, on Toll Plaza Id, RO Id, date & time and the frequency of such events.
- i. Further it shall also provide the facility to e-mail (automatically) such generated reports to a designated list of recipients at pre-programmed times of the day, week & month and on demand.
- j. Integrated Video Conferencing (VC) Solution shall be provided for enabling VC between HQ, ROs and Toll Plazas. During VC, the participant shall be able to utilize the whole video wall or a portion as required. The participant shall also be able to share any document/drawing with the RO/HQ for review/approval. The documents/drawings

shared during the VC shall be stored in the respective storages with date and time stamp and shall be accessible by HQ and the concerned RO. Suitable number of IP based video and basic phones to be provided at each level.

7.4 Video storage at the NHAI Regional Offices (RO)

- a. Video streams on a 24x7 basis, from individual PTZ CCTV and fixed Cameras located in each toll plaza associated with/ attached to the particular RO, shall be stored in a server based Storage located at the RO premises.
- b. The period of storage of video streams from each such camera shall be for a minimum of 90 days after which over-writing shall be allowed on a First-In-First-Out (FIFO) basis.
- c. As the above server-based storage forms the primary storage for archiving and retrieval for the complete system it is essential that its performance and reliability are adequately secured. Thus the system at the RO shall be ensured by the Service Provider to include and support the following features:
 - i. Any failure of any other component in the RO system other than the storage, incoming leased-line router bank, outgoing leased-line router shall not affect the performance of
 - (a) The transmission of on-line video streams received from individual plazas to the NHAI control room at the required bandwidth.
 - (b) The fail-safe storage of such video streams in the storage at the RO.
 - (c) The retrieval of video streams as required by the NHAI HQ control room from the storage at the required bandwidth.
 - ii. The incoming leased-line router bank (from the toll plazas) and the outgoing leased-line router (to the NHAI HQ control room) shall be suitably designed to ensure a adequately high level of availability as per the service level requirements provided elsewhere in this document.
 - iii. The UPS power supply provided to the sub-system consisting of the routers, local switch and the storage shall support this sub-system for a minimum period of 4 hours in case of input power supply failure.

7.5 Functional Requirement of the Network Management System at HQ

- a. Should be able to discover, configure, monitor, manage, generate alarms and deploy configurations to dynamically update groups of devices.
- b. Should allow flexible definitions of administrator roles and responsibilities with RBAC (Role based Access Control) for different teams located at RO and HQ
- c. Should enable performance management by providing customizable dashboards and historical data visibility
- d. Should be able to generate reports designed to summarize utilization of and traffic patterns on network interfaces
- e. NMS shall be able to monitor and configure asked network devices (should be proposed against the proposed devices) and should have scalability to manage up to 5000 devices. NMS shall be able to manage both wired and wireless networks in single pane of glass management.
- f. NMS should be scalable to provide Deep application visibility, Net Flow/S flow, packet inspection to recognize a wide variety of applications and SNMP. NMS should be able to provide Network topology.
- g. NMS solution should deliver pinpoint visibility into the - who, what, when, where, and how of wireless access through its own data collection and key integrations. It should support spatial / floor mapping; integrated location-based tracking of client



- h. Should provide a customizable at-a-glance summary of all discovered devices and existing network switches to proactively identify problem areas and help prevent network downtime. The network has to be manageable at Network Operations Center (NOC) and through secured browser
- i. Should allow administrators to track device configuration changes, enabling viewing, retrieval, and restoration of configuration files, and monitoring of configuration drift for troubleshooting purposes. The system design should provide access to only authorized users, RBAC and by using Secure Digital Certificates to completely trace back an individual user.

7.6 Routing and Switching components

7.6.1 Functional requirement for 4 port Industrial Grade and 8 Port Switches at Toll Plaza

- a. Switch should support port security, DHCP snooping, IGMP Snooping, BPDU Guard and spanning tree root guard.
- b. Should support IEEE Standards of Ethernet: IEEE 802.1D, 802.1s, 802.1w, 802.3ad, 802.3x, 802.1p, 802.1Q, 802.3, 802.3u, 802.3ab, 802.3z, 802.3af, 802.3at.

7.6.2 Functional Requirement for L3 Switches at RO and HQ

- a. Switch should support port security, DHCP snooping, Dynamic ARP inspection, IP Source guard, BPDU Guard, spanning tree root guard.
- b. Switch should be IPv6 Certified/IPv6 logo ready and Switch / Switch's Operating System should be tested and certified or in process of certification for EAL 2/NDPP or above under Common Criteria Certification.
- c. Switch should have 1:1 redundant internal power supply. Power supply modules, fan modules and transceivers modules should be hot swappable.
- d. Should support IEEE Standards of Ethernet: IEEE 802.1D, 802.1s, 802.1w, 802.1x, 802.3ad, 802.3x, 802.1p, 802.1Q, 802.3, 802.3u, 802.3ab, 802.3z, 802.3az.

7.6.3 Functional Requirement for Routers

- a. Router should have static Routes, OSPFv2, OSPFv3, BGP4, MBGP, BFD, Policy based routing, IPv4 and IPv6 tunneling.
- b. To encrypt sensitive data on WAN links router should have hardware based DES, 3DES, AES and Suite-B encryption standards through with support of standard based IPSec, IKEv2 for both IPv4 and IPv6 traffic. QOS with Hierarchical QOS support.
- c. Router should support accounting of traffic flows for network planning and security purposes. Router shall provide application recognition through analysis of flows and application level insight with deep packet visibility.
- d. Router should support extensive support for best path/route selection for metrics like delay, latency, jitter and packet loss to assure business-critical IP applications and monitor the SLA on WAN links.
- e. Router should support traffic load balancing capability on dual WAN Links based on based on advanced criteria, such as reachability, delay, loss, jitter and bandwidth utilization.
- f. Router should be IPv6 Certified/IPv6 logo ready certified
- g. Router / Router's Operating System should be tested and certified for EAL 4 or NDPP under Common Criteria Certification. AAA authentication based on RADIUS and TACACS+ for administrator authentication on centralized AAA.



7.7 System Security

Service Provider will ensure Cyber security of the network, data and entire system, adequate security measures must be taken to protect from cyber-attack and data theft. The Minimum required security solutions are as mentioned below:

- a. Network perimeter with ACLs
- b. WAN Links shall be secured
- c. TACACS/RADIUS server at HQ level for AAA
- d. Firewalls with inbuilt IPS and URL filtering at the RO and HQ levels

7.7.1 Minimum Functional specs for Next Generation Firewall at RO and HQ

- a. Proposed Firewall should not be proprietary ASIC based in nature & should be open architecture based on multi-core CPU's to protect & scale against dynamic latest security threats.
- b. The appliance hardware should be a multicore CPU architecture with a hardened 64-bit operating system to support higher memory.
- c. The solution must be capable of passively gathering details unique to mobile devices traffic to identify a wide variety of mobile operating systems, mobile applications and associated mobile device hardware.
- d. Should support more than 3000 (excluding custom application signatures) distinct application signature as application detection mechanism to optimize security effectiveness.
- e. Firewall should support creating access-rules with IPv4 and IPv6 objects simultaneously.
- f. The device should be able to identify attacks based on Geo-location and define policy on the basis of Geo-location
- g. Management solution shall be provided

7.8 Power supply

- a. The field equipment shall use the locally available mains power supply (from the electricity utility) as the primary source and supported with a relevant UPS power and / or renewable power support to ensure 24x7 operations.
- b. The NHAI HQ control room and RO control room shall use the locally available mains power supply (from the electricity utility) as the primary source. The System shall be supported with a UPS back up to ensure 24x7 operations at RO whereas existing UPS power at NHAI HQ shall be made available.
- c. Except where detailed in specific sections below, all equipment shall be powered from single phase 230Vac 50Hz supply.
- d. System enclosures shall include a power distribution subsystem for supplying power to each component within the enclosure and related / inter- connected equipment. The circuit breakers shall be properly sized according to the expected loads of the concerned equipment and to meet relevant electrical code requirements.
- e. All electrical equipment and cabling shall be provided in accordance with relevant BIS standards. In case there no relevant BIS standard exists the BS 7671 standard shall be applicable.
- f. The power distribution panel shall be directly fed by the main circuit breaker at the electrical point of service. The power distribution assembly shall include an interface and connection to the UPS (where provided). The power assembly shall be connected to the earthing system.
- g. The enclosure shall be earthed in accordance with the relevant BIS and NBC 2016 regulations.



- h. The enclosure shall include a 230Vac 15 Amps 3-pin dual socket power outlet conforming to BIS standard.
- i. The power sockets shall be installed in accordance with relevant BIS standard.
- j. Surge Protection Devices (SPDs) shall be provided at main's entry level (LT Panel level / Entry panel – 230/400 V AC or at UPS level) for each external cable (related to power supply, signal, data or any other), connection which is terminated at any item of exposed external equipment, or routed through an outdoor area at Toll Plaza, RO and HQ. The SPD shall be rated in accordance with IEC 61643-11 and NBC 2016 latest and valid standards.
- k. The SPD shall be non-exhausting metal encapsulated, spark gap based technology.
- l. The SPD shall be tested as per IEC 61643-11:2011 (or equivalent EN 61643-11:2012) from KEMA or VDE international independent test labs. The SPD shall be rated for 255 V.
- m. The SPD shall be capable to discharge Lightning current (10/ 350 μ s) of 25 kA for L-N and 100 KA for N-E . The device shall have voltage protection level of device shall be $\leq$ 1.5 KV including inbuilt fuse.
- n. The SPD shall have current extinguishing capability [L-N]/[N-PE] : 100 KArms / 100 Arms. The device shall have followed current limitation/Selectivity resulting in no tripping of a 35 A gL/gG fuse up to 50 KArms.
- o. The device shall have built in fuse and operation of SPD shall be independent of Line current. No requirement of additional overcurrent protection.
- o. The device shall have mechanical indication based health indication for L-N and N-PE SPD along with the common potential free contact / changeover contact for remote monitoring.
- p. Network Surge Protection Device (SPD): The different components of system shall be installed with surge protection device in accordance with IS/IEC 62305-4, the selection/location shall be decided depending upon the criticality of the application. The communication interfaces shall be installed with suitable SPD. General specifications of SPD for POE are mentioned below. Service Provider shall install suitable SPD for 12V DC supply and 5V DC supply, as applicable and complying to IEC 61643-21.

7.8.1 General Specification of SPD for POE:

- a. The device shall be capable to discharge lightning impulse current (at 10/350 μ s) of 0.5KA & 10 KA total nominal discharge current (at 8/20 μ s).
- b. The device shall be suitable for maximum continuous DC voltage of 48V.
- c. Voltage Protection level (line to line / line to ground) of device shall be $\leq$ 700V.
- d. The device shall be enclosed within Zinc die cast material.
- e. The device shall be DIN rail mounted adopter type with sockets.
- f. The device shall comply to IEC 61643-21/ EN 61643-21 and shall be UL approved.
- g. Cut-off frequency shall be minimum 100 MHz..

7.9 Earthing

- a. Earthing of all equipment shall be made by using UL listed 3 mtr copper bonded rod (minimum 250 micron) with 17 mm dia, complying with **NBC 2016, IS 3043 and IS/IEC 62305-1/2/3&4 standards**. The resistance value shall be as low as possible in every case. Above ground metal piping in the process/valve area (subject to non Cathodically protected) shall be Earthed.
- b. From the viewpoint of lightning protection, a single integrated structure earth-termination system is preferable and is suitable for all purposes (i.e. lightning protection, power systems and telecommunication systems). The earthing system of a number of structures shall be interconnected so that a meshed earthing system is obtained. This will give low impedance between buildings and has significant lightning electromagnetic

pulse (LEMP) protection advantages. Thus, different earthing systems like lightning protection earthing, electrical earthing, safety earthing, electronics earthing etc shall be interconnected.

- c. **Isolating spark gaps (ISG)** shall be complying to IEC 62561-3, used at the places where direct interconnection is non-permissible to create equi-potential bonding throughout the earthing system at the event of lightning with lightning impulse current (10/350 μ sec / Iimp) up to 100 KA and rated impulse sparkover voltage of ≤ 1.25 KV with IP 67 degree of protection.

7.10 Uninterruptible Power Supply (UPS) Subsystems

- a. The worst-case power-load data shall be used to design the electrical conductor sizes. These shall be submitted to the NHAI and/or the NHAI's representative for approval.
- b. A UPS shall be provided wherever required. The UPS shall meet the requirements of relevant standards of BIS.
- c. Unless otherwise stated in the design drawings and/or specifications, UPS with a minimum of four (4) hour backup shall be provided for all system equipment and telecommunications device locations at all ROs & Toll Plazas.
- d. An Automatic Power Transfer Switch (APTS) shall be provided inside the ground mounted enclosure which transfers power from one of the external sources to the electrical distribution system. The APTS shall monitor the status of the primary power source and transfer the power connection to the secondary power source when primary power source fails or suffers degradation. The APTS shall be provided with means to operate in manual mode.
- e. The APTS must be able to transfer the connection with the internal power system, from the primary power source, to the secondary power source, within 1 mains power cycle (less than 20ms).
- f. Additional equipment necessary to eliminate the delay in the transfer of power sources which may cause the system equipment to reboot shall be provided.
- g. Each external power supply line shall be terminated at the APTS.

8. Equipment specifications

8.1 PTZ CCTV Camera

- a. The rated resolution should be sufficient to view the target area in acceptable detail for all cameras. Vehicle characteristics such as colour, shape, vehicle registration number and vehicle class shall be discernible from a distance of 600 meters from the camera (at full optical zoom) in day and night conditions under the prevailing light conditions at the Toll Plaza.
- b. AGC and Auto iris combination shall provide a light range adaptation of 10000:1 or better.
- c. The camera shall have day-night IR filter for brilliant daytime colour and excellent night vision under low light.
- d. The camera shall have the ability to communicate using a choice of technologies (Wired ether-net, WIFI, OFC etc.) to allow for system scalability and smooth integration, as the communication infrastructure is changed or upgraded.
- e. PTZ cameras shall allow for 360 degree pan, 2 to 92 degree tilt and at least 35x
- f. Optical zoom to provide for coverage of a wide target area and yet maintain the required image detail. All PTZ cameras shall have Closed loop speed control with Integral pan / tilt motor drive to enable smooth, precise pan-tilt for fine control and accurate tracking, even at high zoom levels.

- g. The camera shall have an internal heater for better optical performance in rainy, humid environments.
- h. The camera housing shall be waterproof, weather-sealed and corrosion resistant.
- i. It shall be ensured that the Camera mounted on the pole provides an adequately stable image up to wind speeds of 200 km / h such that a vehicle's make and model can be clearly identified on the control room display, at full zoom. Such a stable image shall also be ensured when vibrations are encountered during the passage of heavy vehicles close to the CCTV pole.

8.1.1 Housing

- a. Camera mounting requirement: Vandal-proof wall/pole/corner/hanging mount as per site
- b. Cable entry: IP66 compliant cable pass-through
- c. Construction: Aluminum or engineering plastic with optically clear UV protected polycarbonate dome.
- d. 24*7 fan assisted thermostatically controlled Heater/defogger/forced air cooler
- e. Rated input voltage: 230 VAC 50 Hz
- f. Output voltage: 24/12 V AC/DC as required by the camera and zoom components
- g. Nominal power: 50 watts
- h. Environmental: The housing shall meet: Ambient temperature -10 to + 55 Degrees Celsius and Maximum Relative Humidity: 0 to 95 % RH non-condensing

8.1.2 PTZ camera specifications

Specification Item	Detailed Specification Description
Image Sensor	1/3" Progressive CMOS
Active Pixels	1920x1080 (2MP)
Resolution	720p or better matching the Active Pixels of the Camera offered by the Service Provider to meet above
Sensitivity	0.005 lux (B/W), less than 0.06 lux (Colour) or better
Compression	H.264, MJPEG & MPEG-4, G.711, G.726
Focus	3.5mm to 129mm or better
Optical zoom	30x HD Optical zoom or better with auto focus
IR Illuminator	100 m or better
Signal to noise ratio	50 dB or better
AGC	Automatic
White Balance	Automatic
Electronic shutter	Auto/Manual, 1/1 ~ 1/30,000s
Iris control	Automatic
Scanning format	PAL
Power input	POE or better
Video Output	Ethernet 10/100 Base-T
Pan Range	0 to 360 degrees endless, Auto flip at 180 degrees with auto patrol mode
Pan Speed	Variable 0.2 degrees per sec. to 80 degrees per sec.
Tilt Range	180 degrees (+90 to -90 degrees)
Tilt Speed	Variable 0.2 degrees per sec. to 40 degrees per sec.
Preset positions	255 minimum.
Housing	IP66 or better, Vandal-proof IK10 and NEMA 4X-rated housing
Environmental	Temperature -30 to + 55 Degrees Celsius and Maximum Humidity: 90% or better
Protection	Class – D for data/signal lines and class B for power
On-board Storage	SD/SDHC/SDXC card slot, so that Video can automatically be recorded to a microSD card when the camera loses network



	connectivity.
Open API	Support for ONVIF for interoperability and communications with other ONVIF appliances

8.2 Fixed CCTV Camera with video analytics module

8.2.1 Camera

- The rated resolution should be sufficient to view the target area in acceptable detail for all cameras. Vehicle characteristics such as colour, shape and vehicle class shall be discernible from a distance of 200 meters from the camera (at full optical zoom) in day and night conditions under the prevailing light conditions at the Toll Plaza.
- AGC and Auto iris combination shall provide a light range adaptation of 10000:1 or better.
- The camera shall have day-night IR filter for brilliant daytime colour and excellent night vision under low light.
- The camera shall have the ability to communicate using a choice of technologies (Wired ether-net, WIFI, OFC etc.) to allow for system scalability and smooth integration, as the communication infrastructure is changed or upgraded.
- The camera shall have an internal heater for better optical performance in rainy, humid environments.
- The camera housing shall be waterproof, weather-sealed and corrosion resistant.
- It shall be ensured that the Camera mounted on the pole provides an adequately stable image up to wind speeds of 200 km / h such that a vehicle's make and model can be clearly identified on the control room display, at full zoom. Such a stable image shall also be ensured when vibrations are encountered during the passage of heavy vehicles close to the CCTV pole.

8.2.2 Housing

This shall be an aluminum enclosure designed for outdoor CCD camera installations and shall meet the following minimum requirements:

- Camera mounting: Removable cradle assembly
- Cable entry: via liquid-tight fittings.
- Construction: Extruded aluminum housing, Aluminum rear-end cap, Aluminum front cap with glass faceplate, and aluminum cradle, a sunshield to be included
- Window: 5 mm thick, with a Thermostat controlled window
- Environmental: The housing shall meet → IP 66 for total protection against dust and heavy rain. Ambient temperature -10 to + 55 Degrees Celsius and Maximum Relative Humidity: 0 to 95 % RH non-condensing

8.2.3 Other camera specifications

Specification Item	Detailed Specification Description
Imager	1/2.8" Progressive CMOS or better
Sync. System	Internal with Crystal, External with Mains synchronization
Resolution	2048x1536 (3MP)
Signal to noise ratio	>50 dB minimum
Minimum Illumination	0.15Lux(F1.2,AGC On)at 50 IRE
IR Illuminator	25 meters or better
Electronic Shutter	Manual: 1/50 to 1/10000 sec, 8 selections possible. Automatic : AES 1/50 TO 1/100000 Sec.
Back Light Compensation	6 Zones
Camera Text in Picture	16 Character title anywhere on screen
Compression	H.265, H.264 (MPEG-4 Part 10(AVC))
Power input	12V DC, POE



Environmental	IP 66, Ambient Temperature -10 to + 55 Degrees Celsius and Humidity: 90%
Housing	Vandal-proof IK10-rated metal housing
Local Storage	SD/SDHC/SDXC card slot, so that Video can automatically be recorded to a microSD card when the camera loses network connectivity.
Open API	Support for ONVIF for interoperability and communications with other ONVIF appliances

8.2.4 Video Analytics Module

- The system offered shall be modular and multi-functional i.e. detection of more than one type of incident.
- The boards shall fit directly into racks without an interface box.
- The boards shall have input ports to monitor a minimum of four (4) separate cameras.
- The boards shall be installed in an outdoor housing that is also mounted on the same pole as the camera.
- Environmental:** Ambient temperature -10 to + 55 Degrees Celsius and Maximum Relative Humidity: 95 % RH non-condensing.

8.2.5 Video Analytics and Synopsis System

8.2.5.1 Background

Surveillance CCTV and fixed cameras keeps on recording and storing the Video feeds on 24x7 basis. These recorded video files are typically extracted and reviewed at the control centres during the administrative surveillance / investigation of any reported incidents. Unfortunately, a lot of valuable time and man-power is lost, post-incident, in reviewing a huge cache of recorded videos for finding the clues related to the incident. Moreover, there should be a mechanism to convert this huge reservoir of recorded video data into some valuable information and reports through an intelligent and innovative video synopsis tool to facilitate investigation which shall reduce the post-incident video review time with intelligent filters and shall also show the intelligent vehicle & traffic metrics from the raw video-feeds recorded from various CCTV Cameras on the National Highways.

Basic purpose of video analytics and synopsis system is to automatically detection of any abnormal condition from a 24x7 running video in live or offline mode. This function shall be required to be performed at RCC under all ROs and CCC, NHAI HQ, wherein the operators shall be required to access any abnormal pattern of traffic movement at all the toll plazas on daily basis.

It should be able to help take proactive actions by monitoring digitally encoded video streams from fixed cameras on toll plazas to immediately detect incidents and continuously collect real-time traffic information. The system alerts should be visually verifiable providing more information as to what is actually happening at the Toll Plazas thereby improving the operations efficiency of traffic supervisors at control room by reducing manual process incident identification through continuous monitoring of live videos by operations staff.

8.2.5.2 Functional Requirements

- The System / software shall be able to analyse the **pre-recorded/archive videos** and be able to detect any abnormality and should be able to filter and list out the small snapshots (like 30 seconds to one minute prior and 30 seconds to one minute post the incident for better understanding) of such incidents for micro monitoring/ analysis. Such snapshot video clips should be easily accessible and the process of fetching them out of

- continuous video recording should be parametric (e.g. based on vehicle colour, type, dimensions, abnormal movements, abnormal speeds, date and time stamps, etc.).
- b. This video analytic module is a value added tool deployed at the control centres to detect valuable information from continuous video of long durations. It may be hardware based or software based or the combination of both and should be able to effectively aid proactive traffic management and traffic guidance. Software shall be capable of compacting hours of video into “briefs” of mere minutes that concentrate and draw attention to critical events.
 - c. Software shall allow the user to view the original video from the synopsis video at any time.
 - d. It should be able to capture problem areas such as vehicular movement in wrong direction, stopped-vehicle, increase or decrease in traffic volume, frequent slow down at the toll plaza, etc on user-identified specific physical areas at the toll plaza and surrounding areas within the view of the relevant camera
 - e. The application should be browser based and should permit the operator at control room to access and configure analytics based on defined parameters. It should not require loading additional hardware / workstation at the control centres.
 - f. The customization of the system should be user friendly to allow the operators at control centres to decide what qualifies as the significant incident for each camera.
 - g. The control centre operators should be able to create custom rules so that just the events they specify as important / relevant will trigger alerts. Software shall allow to define and receive alerts via e-mail or push notification for live monitoring and proactive review.
 - h. The system should be highly reliable for data acquisition and independent of climatic conditions.
 - i. The control centre operators should also be able to set the sensitivity of different thresholds for each individual camera by location, day of the week and different times of the day.
 - j. The control centre operator should also be able to adjust sensitivity and notification of alerts based on incidents such as
 - (i) Wrong side vehicle movement
 - (ii) Stopped vehicle / debris in roadway is stationary for more than the specified threshold
 - (iii) Vehicular congestion if lane occupancy exceeds the specified percentage
 - (iv) Pedestrians on the carriageway including any mishap.
 - (v) Slow speed vehicles such as below specified threshold for specified duration
 - (vi) Irregular / zig-zag movement of vehicles approaching toll plaza.
 - (vii) Average speed of traffic flow at different point of time, zone occupancy, average speed per vehicle, real-time data on queue length at an interval of every 5 minutes. etc.
 - k. Information Dissemination should be enabled in a manner that as soon as the incident is detected, it is either brought to the attention of manual operator at control centres or pre-programmed responses are implemented. A pop-up window shall open on the operator’s console in case of any of the incident or abnormality is detected. The operator should have the option to get the pop-ups on the video wall. The size and number of pop-up windows should be easily customisable.

8.2.5.3 Data collection and storage

The system should facilitate the output of video analytics to be stored for a period of five years on cloud based storage.

8.2.6 Camera Pole

- a. Fixed poles are envisaged for the mounting of the PTZ and Fixed CCTV Cameras.
- b. The poles shall be designed to offer a stable platform for the imaging equipment to operate. Each pole and its associated hardware shall be fabricated using material appropriate for its installation site.
- c. Nominal mounting height may be assumed as 12 meters. However, some situations may warrant different heights.
- d. Fixed pole cross section shall either be circular with a typical outer diameter of 150 mm near the base or of equivalent hexagonal section. The design shall be tapering gradually over the whole length with the minimum cross section at the top.
- e. The joint(s) shall be seam welded.
- f. The fully fabricated pole column shall be of stainless steel/galvanized/Enamel Painted/powder-coated to an appropriate minimum coating thickness.
- g. The poles shall incorporate suitably designed holes on the sides to allow for electrical cables to enter or exit the pole undamaged.
- h. The bottom portion of the pole shall be treated for corrosion resistance in accordance to the installation site.
- i. The design shall be base plate mounted with a matching foundation.
- j. The poles shall be supplied with a mounting template, rag foundation bolts and other associated installation hardware.
- k. An access door at the bottom of the pole shall be provided at a typical height of 0.5 meters from the base for the termination panel. The typical door dimensions shall be 125mm wide by 500 mm high.
- l. The structural design shall conform to relevant standards and shall be certified by a statutory authority for structural integrity and maximum allowable vibration (typically caused by Wind forces and other external stimuli) to ensure a stable image at full optical zoom of the camera mounted on it.
- m. Deflection due to wind shall not exceed 0.1 degrees at a wind speed of at least 28m/s with the equipment mounted on the pole.
- n. Suitably sized powder coated terminal box and terminal block assembly shall be provided and be treated as a part of the fixed pole. It shall be installed on the pole near the bottom end and the joint, cable entry/exit points (or glands) shall be sealed using a water proof sealant to avoid water ingress into the box or the pole base.

8.3 Video Conferencing

8.3.1 Functional and Architecture Requirement for Voice and Video Communication Solution

The solution proposed should integrate with the existing unified communication system at NHAI HQ to connect to any IP phone or VC system in the conference. Standards based H.323 or SIP is the protocol for communication currently used, more details can be provided. Solution shall meet the following minimum requirement:

- a. Quality: All the nodal agencies viz Toll Plaza, RO, HQ and, the VC units must have at least 720p HD video resolution and Hi Fidelity audio.
- b. Software VC Client Base Features: VC software for mobile phone/ Laptop/tab and all-in-one workstation must be able to participate in Video conference meetings, share files like presentation/photo/spreadsheet, share screen, chat or exchange files or project status reports. Basic features like to place a call on hold, able to view presentation from RO and HQ, software mute button, software keypad, full screen mode, hold button and transfer button and conduct a multiparty party discussion from their mobile devices should also be provided.



- c. VC client on mobile phone must be able to select the front or back camera on the mobile phones.
- d. The solution must have the ability such the PDs can have the VC software on multiple devices simultaneously and they will be able to have the same extension number or SIP URI. This will enable them with the flexibility to use any device of their own choice for making and receiving calls.
- e. The HQ and RO hardware based VC Units must seamlessly interface with the video wall and have the ability to send two separate video streams one for the people and the other for the presentations. Use of HDMI or DVI HD inputs is preferred.
- f. Security Features:
 - i. VC units on the internet must be authenticated before being able to register onto the call control server. As the traffic must pass through firewall the ports on the firewall for the UDP traffic needs to be opened only from the inside to outside so that no spoofing or hacking using UDP port must happen. The solution must be H.460.18 and H.460.19 compliant.
 - ii. The solution must support TLS and SIP for secure communication with support for AES128
 - iii. Only authorized users with valid user name and password must be able to log in. The software must have support for security certificates.

8.3.2 Video Conferencing Hardware Unit at RO and HQ

- a. The VC unit at the RO and HQ will be used to have a conference call with any Nodal agency as well as the PD's and Projection Execution Sites. The unit must have two HD outputs to show people and presentation as two separate streams.
- b. The presentation can be shown from any of the toll plaza offices. It must be HD 720 mode and shall support various file formats like PPT, Spread sheets, Word documents etc.
- c. The Unit must have a HD camera which can be mounted a suitable location and to capture the command center. The camera must have at least 10X zoom with capability to zoom into any of the participants and a wide angle of at least 65 degrees Horizontal field of view.
- d. The unit must support microphone inputs to connect the OEM microphones. In addition, the units must suitable /appropriate powered input to connect external microphones if need be. The mic inputs must support automatic gain control and echo cancellation.

8.3.3 Specification for Multi-party Conferencing Unit

- a. A central Multi party conference unit based on SIP and H.323 protocols, with Call control and Firewall traversal solution are required.
- b. The central infrastructure must have the ability to connect all the 24 RO's and VC Clients at Tolls or PD Handheld with the HO in a single conference call.
- c. It should be possible for each of the RO's to connect each of the toll plaza offices in a conference.
- d. The PD's and Project Execution Site must be able to get into a conference with the RO or amongst them.
- e. The call control server will have the ability to authenticate any software based and hardware based VC device using a user name and password.
- f. The MCU must have the following conference capability:
 - i. Host 3 different conferences simultaneously.
 - ii. Show all the RO's simultaneously to the HQ so that all of them can be seen on the video wall.
 - iii. H.264 AVC, G.711/G.728, AAC-LD must be the minimum standards that need to be supported.
- g. The total port capacity must be at least 96 HD 720p or 192 SD ports from day one.
- h. MCU shall support recording with file storage locally and transfer on NAS.



- i. Service Provider shall also provide streaming solution to stream live or stored video /contents up to 500 users.

IP and Video Phone/Endpoint required as per below numbers:

- 1) Toll Plaza - 1 nos. Video Endpoint at each toll plaza
- 2) RCC, RO Office - 2 nos. (1 Video phone & 1 basic IP Phones)
- 3) CCC, HQ - 3 nos. (1 Video phone & 2 basic IP Phones)

Phones provided shall be seamlessly integrated with existing voice solution installed at NHAI HQ with all telephony and video telephony feature. Senior officials like GMs, PDs and above officials having both VC Client and Phone shall use same extension number and telephony features

- i. Video Phone with minimum 5" Screen, 720p Video Camera, 2 GE Ports, 4 Programmable line keys and 4 contextual soft keys, Encryption support, Wideband or High Definition Audio support. Call manager and Phone shall be from same OEM.
- ii. IP Phone: Black and white 3.5" or higher screen with two 10/100 ports, 2 Programmable line keys and 4 contextual soft keys, Encryption support.
- iii. High End Video Endpoint (VC) for Toll plazas: Must support at least 720p resolution, 23 inches or higher size touch screen HD display with at least 2 megapixel inbuilt document reader camera. Video phone/Endpoint shall have integrated Camera, Codec, HD display, wifi connectivity, HiFi speakers, microphones, HDMI port for input from PC all built-in as a single unit from the OEM.

8.4 Storage

8.4.1 Minimum storage specification for RO Type 1 and 2:

- a. Unified Storage with two controllers having no single point of failure Architecture with support of NAS & SAN and high availability at each level. System Data mover/controller should support 2x Intel Xeon E5-2600 6- core CPU or higher.
- b. Protocol Support configured - CIFS/SMB 3/ NFS 4/iSCSI/FCoE.
- c. Operating System Platforms & Clustering including: Linux/Windows
- d. Each controller should be provided with minimum 128 GB RAM with usable protected data Cache for Disk IO Operations and cache protection mechanism either by de-staging data to disk/flash or protecting with NVRAM or equivalent
- e. The storage system shall be capable of providing host connectivity as per solution offered (Unified/SAN/NAS/Scale out NAS).
- f. RAID levels Supported: 0, 1, 5, 6, 10 (Dual parity or higher) or equivalent with RAID 6 or higher. The capacity should be provisioned with dual data protection
- g. Fans and power supplies: Dual redundant, hot-swappable
- h. The storage system should support up to 400 TB capacity using 6TB or higher capacity 7.2K RPM NL-SAS disk with Dual parity raid configuration and global hot spare disk. Service Provider shall provide the adequate storage at each RO as per the solution design.
- i. Should provide de-duplication functionalities for the configured capacity.
- j. All the necessary software and licenses to configure and manage the storage space, RAID configuration, logical drives allocation, snapshots, compression, de-duplication, replication, monitoring of Disk drives, auto-tiering for the configured capacity to be provided.

8.4.2 Minimum storage specification for RO Type 3 and HQ:

- a. Form Factor: 2U, 19" Rackmount
- b. Capacity to be configured upto 100 Terabytes raw as per solution design to store 90 days at RO and 6 years incident data at HQ with appropriate RAID solution. Service Provider to provide the additional or lower storage as per the solution requirement



- c. Protocol Support NFS/CIFS/RSYNC/FTP
- d. Max Raid Volume Capacity Limited only by amount of storage present
- e. Operating System Enterprise-Class like with an Open Window/Linux/equivalent kernel with the GNU/Debian user interface / Equivalent
- f. Processor Dual Intel Xeon E5 processor 2600 v4 series / latest Equivalent-the processor to be proposed shall be minimum 6 Core CPU 2.2GHz
- g. Memory Up to 1TB DDR4- To be quoted with minimum 64 GB RAM
- h. OS Drive (Mirrored set): 2*120 GB or higher as per solution
- i. Hot Swap 12*3.5" HDD (Front) in addition to OS Drives asked above
- j. Expansion Total 5 PCIe slots: 3x PCI-E 3.0 x8 & 2x PCI-E 3.0 x16
- k. Storage HBA 12Gb/s SAS Controller (optional as per solution)
- l. Ethernet Dual port 1G Base-T,
- m. Virtual Machine Device Queues reduce I/O overhead
- n. Supports 10GBase-T, 100BASE-TX, and 1000BASE-T- 100 Base-T
- o. The Service Provider can cohost VMS software and storage on this server to optimize the solution with required CPU, memory and capacity to meet the design/solution requirement

8.5 Graphic Display/Video Wall

The video wall shall typically as per the configuration mentioned below. However, the Video wall controller shall be capable and flexible enough to accommodate varied different monitor matrix geometries as dictated by space availability or constraints.

8.5.1 Configuration

Laser DLP video wall of diagonal cubes of suitable size

- a. **CCC at HQ:** the size of graphics display portion should be 6 meters X 1.75 meters ($\pm 10\%$)
- b. **RCC at RO Type 1 & 2:** the size of graphics display portion should be of a minimum size of 2.2m x 1.25 m but not exceeding 3 meters X 1.75 meters
- c. **RCC at RO Type 3:** the size of graphics display portion should be minimum of 2.2 m x 0.6m but not exceeding 3 meters X 0.9 meters
- d. The Graphic display shall be provided complete with base stand.

8.5.2 Hardware

Specification Item	Detailed Specification Description
Cube & Controller	Cube & controller should be from the same OEM
Native Resolution	Full HD
Light Source Type	Laser Light Source. Individual cube should be equipped with multiple laser banks and each laser bank should have an array of diodes. Failure of single/multiple diode/s in a Laser bank should not affect the display of image on the screen
Brightness of Projection	Minimum 2000 Lumens
Brightness of Cube	Minimum 600 nits
Dynamic Contrast	1000000:1 or better
Brightness Uniformity	Minimum 95% or above
Control	IP based control to be provided
Remote	IR remote control should also be provided for quick access
Screen to Screen Gap	0.2mm or better
Screen Support	Screen should have sufficient back support to prevent bulging
Control BD Input terminals	Minimum 1 x Digital DVI, HDMI and analog port as per OEM standard Output: 1 x Digital DVI
Source Redundancy	System should be able to switch to HDMI input if primary DVI input is not available. System should also automatically switch back to primary DVI input from HDMI input as soon as the primary DVI input is available again.
Auto color adjust function	Should provide auto color adjustment function Should be sensor based
Intelligent Sensor for Self-Correction	Minimum parameters: Internal Temperature, Ambient Temperature, Humidity, Brightness, Cooling, Light Source Status



	Should be possible to demonstrate these parameter through active monitoring interface
Anti-Dust Design	Projection system designed to meet IEC/ EN-60529
Maintenance Access	Rear (≤ 750 mm Depth)
Cube Size	OEM specified so that the matrix meets the overall size requirement of the graphic display

8.5.3 Cube control & Monitoring

Video wall should be equipped with a cube control & monitoring system.

- System should have OEM specified framework with web browser architecture.
- Should be able to control & monitor individual cube, multiple cubes and multiple video walls.
- Provide video wall status including Source, light source, temperature, fan, power information, etc., as applicable.
- Should provide a virtual remote on the screen to control the video wall.
- Input sources can be scheduled in daily, periodically or chronologically mode or as user defined.
- System should have a quick monitor area to access critical functions of the video wall.
- User should be able to add or delete critical functions from quick monitor area.
- Automatically launch alerts, warnings, error popup windows in case there is an error in the system.
- User should be able to define the error messages such as for information, warning and/or critical etc.
- Automatically notify the error to the administrator or user through a pop up window.
- Status log file should be downloadable in CSV format as per user convenience.

8.5.4 Graphic display/Video Wall Management Software

- Scaling and display: Software to enable the user to display multiple sources in any size and anywhere on the graphic display wall.
- Software should support for auto source detection.
- Should support for Video, RGB, DVI, Internet Explorer, Desktop Application and Remote Desktop Monitoring Layouts.
- Software should able to Save and Load desktop layouts from Local or remote machines. All the Layouts can be scheduled as per user convenience.
- Operating System Platform: Software should support auto launch of Layouts according to specified time or event by user.
- Software should be able to support Integration with 3rd party devices and shall have interface to enable control from 3rd party devices like Creston, AMX etc.
- Software should be user friendly and shall be able to provide live preview of video wall and layout preview option. It should be possible to create offline layouts.
- Authentication System should provide functionality to the administrator to define and allocate work space for a particular operator or a group of operators when working on a Video wall.
- Software should offer 2 levels of Authentication (User accounts, Permissions for functionality & Roles etc).
- Ticker message can be positioned anywhere on the display wall. Inside the ticker window, font size, colour and background can be set. Software should able to prepare three kinds of tickers: text ticker, RSS ticker and time ticker.
- System should support SNTP function.
- Protection System should have Hardware License key to protect the software from unauthorized access.

8.5.5 Graphic Display/Video Wall Controller Workstation

Specification Item	Detailed Specification Description
Processor	Intel i7 processor or higher qualifications
Processor speed	3.0 GHz or faster
RAM	4 GB ECC DDR 2 (800)
Hard disk	500 GB SATA or better
Graphic card	512MB 3D or equivalent
Media	Latest DVD R/W
Operating system	Latest edition of any operating system with vendor support
Network adapter	Dual-port Gigabit Ethernet Controller inbuilt & Supports Add on copper/ optical fiber adapters
Operating temperature	5 to +35 degree Celsius
Reliability and maintainability	MTBF: 30,000 hours MTTR: 1.0 hour
RAID	RAID 0,1,5,10 Support
Powers Supply	Redundant & Hot Swappable
Monitoring Option	CPU, FAN, Temperature
Redundancy support	Power Supply
	HDD
	Cooling FAN
	LAN ports
Scalability	Display multiple source windows in any size, anywhere on the wall
Control functions	Brightness / contrast / saturation/ Hue/ Filtering/ Crop / rotate
Outputs	At per chosen matrix
Resolution support	DVI: 1920x1200 RGB: 2048x1536
Universal Inputs	Universal input (DVI/ RGB/ Component) as per chosen matrix
Accessories	DVD-R,DVD+RW,, Keyboard, mouse
Power Supply	(1 + 1) Redundant AC-DC high-efficiency power supply
Operating Conditions	AC Voltage 100 - 240V, 50-60Hz
	Operating Temperature: 10° to 40°C (50° to 95°F)
	Non-operating Temperature: -40° to 70°C (-40° to 158°F)
	Humidity: 10 – 90% non-condensing
Display & Controller	Display & Controller should be from the same manufacturer
Display controller	Controller to control displays as per the chosen matrix, along with necessary software
Chassis	19” industrial Rack mount, Lockable front door to protect drives with all required accessories

The target image on the Video wall shall be freely resizable and re-positionable on any part of the Screen.

The Video Wall shall be capable of accommodating multiple displays in multiple rows and columns behaving as single logical screen.

8.6 Data Communication network equipment

The communication network depends primarily on bandwidth requirement, which in turn is driven by the following three major factors:

- Equipment type
- Installation topology and
- Volume (Quantity) of equipment.

Since factors a, b, and to some extent c is dependent on vendor solution, a prescriptive specification may be counterproductive. However as a general guideline the following requirements are provided for relevant equipment.



8.6.1 Network switch at the Toll Plaza

8.6.1.1 8-Port non-rugged Switch with 2 Fibre Port at Toll Plaza

- a. Switch shall have minimum 8 nos. 10/100/1000 Base-T ports and additional 2 nos. SFP uplink ports loaded with MMF modules at wire rate performance. Switch to be installed in Toll office shall support -5C to 45C of operating temperature with short term temperature 50⁰ C
- b. Switch shall be IEC 60068-2-6, IEC 60068-2-27, IEC 60068-2-47, IEC 60068-2-64, IEC 61000-4-5.

8.6.1.2 4-Port PoE Industrial grade switch at the Toll Plaza (in Enclosure on Camera Poles)

This device shall have the capability to provide adequate continuous power to each of the CCTV cameras and associated equipment (e.g. video analytics module, PTZ mechanism) to meet the required performance, quality and reliability requirements.

- a. Switch shall have minimum 4 nos. 10/100Base-T (with minimum 3 PoE ports with power budget of 60W) ports and additional 2 numbers of SFP uplink ports loaded with MMF Modules.
- b. Shall have be IP30 rated and shall work on up to 60°C temp in a sealed enclosure and should be DIN Rail mountable.
- c. Switch shall be IEC 60068-2-6, IEC 60068-2-27, IEC 60068-2-47, IEC 60068-2-64, IEC 61000-4-5 and NEMA TS-2 compliant.

8.6.2 24 Port Switch (Layer 3) with 4 Fibre Port at RCC

- a. Switch shall have minimum 24 nos. 10/100/1000 Base-T ports and additional 4 nos. SFP uplink ports loaded with MMF modules with dedicated stacking ports
- b. Switch shall have wire rate performance and 48 Gbps of dedicated stacking bandwidth.

8.6.3 24 SFP+ Port Server Aggregation Switch at CCC

- a. Switch shall have minimum 24 nos. SFP+ ports and upgradable to additional 2 nos. QSFP uplink ports loaded with 12 nos. of MMF Modules and 12 nos. of 1000 Base-T Modules with dedicated stacking ports.
- b. Switch shall have wire rate performance and 240 Gbps of dedicated stacking bandwidth.

8.6.4 Core Switch at CCC

- a. Switch shall have minimum 48 nos. SFP+ ports loaded with 24 nos. of MMF Modules and 24 nos. of 1000 Base-T Modules and 4 nos. of 40 Gig QSFP ports loaded with MMF Modules.
- b. All critical components like supervisor modules, fabric modules and controller modules should be redundant. Failure of one component must not degrade performance of switch.
- c. Switch shall have hot swappable 1:1 redundant internal power supply and hot swappable fan modules.
- d. Switch should be scalable to additional 96 no. of 10 Gig or 48 nos. of 40 Gig Ports or 4 nos. of 100 Gig ports.
- e. Switch shall have minimum 1.28 Tbps (2.56 Tbps in full duplex) switching bandwidth per slot.

**8.6.5 Port Requirement for Routers**

Description	Toll Plaza	RO Type 1	RO Type2	RO Type3	CCC
WAN Throughput	25 Mbps	1Gbps	500 Mbps	200Mbps	2.5GBps upgradable to 10Gbps
Number of Ports (10/100/1000)	1	2	2	2	3
Number of SFP based GE Ports (Future Optical connectivity)	1	2	2	1	2
RAM	4GB	8 GB	8 GB	8 GB	8 GB
Flash	4GB	8 GB	8 GB	8 GB	8 GB
Minimum Number of Routers	1	2	2	1	2

8.7 Security Solution

Performance and Ports Requirement for firewall

Description	Toll Plaza	RO Type 1	RO Type2	RO Type3	CCC
Throughput - Real World Performance including Firewall, application control and IPS	NA	1 Gbps	650 Mbps	400 Mbps	4 Gbps
10/100/1000 Ports	NA	6	6	6	4
10 GE Ports	NA	0	0	0	4
1 GE SFP Ports	NA	0	0	0	0
Connections Per Second	NA	10,000	7,500	5,000	20,000
Number of Simultaneous/Concurrent Connections	NA	700,000	500,000	250,000	1,000,000
Power Supply Redundancy	NA	Yes	No	No	Yes

8.8 Servers at RCC and CCC**8.8.1 Minimum Server Specification (For ROs & HQ)**

- Each server shall have a minimum of 2 CPUs, 2.2 Ghz, 6 Cores each or higher with support for higher configuration CPU like Intel E5-2699 v4 22 core CPUs
- Minimum 8 front-accessible, hot-swappable, SAS, SATA or SSD drives. Minimum 2 Nos of 600 GB 10K RPM SAS HDDs
- Should have at least 24 DIMM slots per rack server with minimum 64 GB of DDR4 Memory from day one. Service Provider to provide higher configuration CPU, Memory and HDD if required as per their solution offered
- Should have 2 * 1 GbE LAN on Motherboard (LOM) for network connectivity
- Up to 2 PCIe Generation 3.0 slots
- Supports hot swappable redundant fans & power supplies
- The proposed server should run on industry standard x86 servers, with OEM being recognized as leader's quadrant in latest modular server report
- Specification mentioned are minimum required however, Service Provider can provide higher configuration as per the solution proposed and can also propose Virtualization to optimize the server requirement

Note: Total number of servers required at each RO and HQ shall be as per the solution design of the Service Provider.

**8.9 All-in-One Workstations at CCC, RCC, and Toll Plazas****All-In-One Workstation Specifications**

Specification Item	Detailed Specification Description
Processor	Intel i3 generation or higher
Graphics	Minimum 1 GB Video memory or higher
RAM	16 GB DDR4 expandable upto 32 GB
Monitor	22" LED backlit, and a glossy or antiglare surface 1366x768 Pixel
Connectivity	Wireless 802.11 b/g/n support, Ethernet RJ45 at least 100 megabits per sec
Optical Drive	DVD RW Drive with dual Layer Support
Storage	Must have 500GB or more, 5400 rpm or more, solid-state drive
Antivirus	Licensed
OS	Latest Windows Professional
Port	USB Ports 1xUSB 2.0; 2xUSB 3.0 Microphone, Ethernet/ LAN HDMI, VGA
Others software	Latest MS Office Professional and other licensed applications as required for smooth operations

8.9.1 Workstation at NHAI HQ & RO**8.9.1.1 Installation requirements**

- The ground mounted enclosure shall be installed according to appropriate good engineering practices. All internal components and UPS (if required) shall be securely mounted.
- For ground mounted enclosure installation, UV-resistant caulking material shall be applied along the joints of the enclosure. For mounting under a camera lowering system, the enclosure shall be positioned away from the space directly below related camera.
- Provisions shall be made for all ducts (i.e. power, telecommunications, etc.), in accordance with the design drawings and/or specifications, that will facilitate the connection between the enclosure and the concerned equipment.
- Where cables enter the ground mounted enclosure, they shall be fixed and secured against movement and to relieve stress on the cable termination. All penetrations to the enclosure shall be sealed with silicone sealant to impede entry of gas, dust and water.
- All wires/cables within the enclosure shall be secured and labeled. Earth wires from all electrical devices, including surge suppressors, shall be terminated directly to the dedicated earth terminal in the enclosure. Earth conductors shall not be daisy-chained from device to device.
- All conductors carrying electricity at 60Vac or higher shall be segregated from all telecommunications, signal conductors and conductor carrying electricity lower than 60Vac. A minimum of 75mm shall be provided between these two conductor groups. Where conductors belonging to these two groups need to cross each other at distances closer than 75mm, the installer must ensure the conductors are at a 90 degree angle (perpendicular) to each other.
- Each wire shall be identified on both ends of the wire with heat shrink, thermal transfer tube type wire markers in English. Adhesive labels are not acceptable. The wire markers shall be white with black lettering. Hand marking of the label is not acceptable.

9. Testing**9.1 General Testing**

Any test facility commissioned to carry out environmental, electromagnetic compatibility or optical performance tests or safety testing of telecommunications equipment shall have adequate accreditation meeting a relevant BIS standard or ISO standard or set up by a relevant government agency as a central facility.



- a. Quality systems relating to the design, development, testing, supply and maintenance of software shall implement the guidance of ISO 9000-3.
- b. The Service Provider shall operate an Environmental Management System complying with the requirements of ISO 14001.
- c. Any certification or accreditation necessary to comply with this specification shall have validity current at the time the Contract is placed and be maintained valid throughout the period of the Contract. Evidence of this certification or accreditation shall be provided.
- d. The Service Provider shall be responsible for any testing and/or certification of equipment needed to meet or demonstrate compliance with statutory or regulatory instruments and requirements.
- e. The offered equipment supplier shall provide reasonable access and facilities for the NHAI or the NHAI's nominated representative to audit the operation of its quality systems and test facilities as deemed necessary by the NHAI or the NHAI's nominated representative.
- f. The Service Provider shall accept all responsibility for the satisfactory quality, design and workmanship of the offered equipment being supplied and every part of the system and equipment whether manufactured by or supplied to the Service Provider by supply chain partners and whether specified or approved by name or not.
- g. Documentation detailing the proposed schedule of tests to be undertaken at each stage of the test process for all offered equipment shall be provided. As a minimum, the tests shall include Factory Acceptance Tests (FAT), Site Acceptance Tests (SAT) and System Integration Tests (SIT). All costs for such tests shall be borne by the Service Provider.
- h. All test equipment shall have a valid calibration certification.
- i. The acceptance of each stage of testing does not imply that testing is complete at that stage. If problems are found at a later date or stage of testing, it may be necessary to return to an earlier stage of testing after repairs have been made to the system. If at a later stage of testing, an item of equipment is replaced, repaired, or significantly modified, the equipment shall be retested to the level necessary to isolate any problem and establish a course of action to remedy the situation.
- j. Test procedures, checklists, test forms and data summary sheets shall be provided for each item. The proposed test procedures shall include a description of the test topics, applicable pass/fail metrics, planned test method and planned test instruments and tools. The NHAI and/or the NHAI's nominated representative shall be notified of the date, time and place of each test, as a minimum at least 28 calendar days prior to the date the test is planned to be conducted. The tests shall be conducted in the presence of the NHAI and/or the NHAI's nominated representative unless specifically authorized in writing by NHAI otherwise.
- k. The NHAI and/or the NHAI's nominated representative shall sign the trial test documents as proof of a successful trial test for each item of the offered equipment and ancillary components. If the test trial is unsuccessful, the NHAI and/or the NHAI's nominated representative shall be given minimum seven (7) full business days' prior notification before rescheduling another test trial.
- l. Offered equipment that fails to conform to the requirements of any test will be considered defective and the equipment will be rejected by the NHAI and/or the NHAI's nominated representative. In the event a defect is determined, it shall be determined whether it is limited to a specific unit or could be potential problems in all such units. Equipment rejected because of problems limited to the specific unit may be offered again for retest provided all issues of non-compliance have been corrected and re-tested and evidence thereof submitted to the NHAI and/or the NHAI's nominated representative. The evidence thereof shall include as a minimum a technical report detailing the investigation that has been undertaken to determine the cause of the failure. The report shall detail, as a minimum, the symptoms, cause and what action was required to remedy

the failure. This report shall be submitted and approved by the NHAI and/or the NHAI's nominated representative prior to a new test date being scheduled.

- m. In the event that the offered equipment malfunctions during the test period, the NHAI and/or the NHAI's nominated representative may declare a defect and require replacement of all equipment at no additional cost. When a defect is declared, the test and test period shall be restarted from the beginning for that specific equipment.
- n. If equipment has been modified or replaced as a result of a defect, a report shall be prepared and delivered to the NHAI and/or the NHAI's nominated representative for acceptance. The report shall describe the nature of the failure and the corrective action(s) taken. If a failure pattern, as defined by the NHAI and/or the NHAI's nominated representative, develops, the NHAI and/or the NHAI's nominated representative may direct that design and construction modifications be made to all similar units without additional cost to the NHAI. In the case of problems common to many units, all units shall be modified at no additional cost to the NHAI.

9.2 Test Procedures

For off-the-shelf or routinely manufactured equipment or components, a test or inspection certificate shall accompany each delivery. In addition, the Service Provider shall submit the factory's routine testing procedures to the NHAI for review and approval.

For equipment, components or software requiring special order, tooling or development, the Service Provider shall submit to the NHAI proposed factory test items and test procedures for review as soon as the System Design is accepted. The test items shall include as a minimum the following:

- a. Functional tests (all equipment and software)
- b. Power supply tests (all equipment)
- c. Input voltage fluctuation (Sampling test)
- d. Instantaneous interruption (Sampling test)
- e. Environmental tests for temperature and humidity ranges as specified (sampling test)
- f. Insulation resistance (sampling test)
- g. Dielectric strength (sampling test)
- h. Rainproof test for field equipment (sampling test)

9.2.1 Equipment Interface Tests

Equipment interface tests shall be conducted for all servers, database, network switches, network adapters, field equipment, and communication equipment in the factory. These tests shall be executed by interfacing as many different kinds of equipment as possible so as to ascertain their suitability as system components. Where there is no appropriate equipment at that particular time to connect to certain equipment, the test shall be executed by connecting to a simulator.

The Service Provider shall notify the NHAI at least seven (7) days in advance of each factory test to be undertaken and shall make arrangement for the NHAI to attend the test if requested. Should the NHAI or his designated engineer decide not to attend any of the tests, the tests shall be carried out under the direction of the Quality Control expert, and the Service Provider shall forward to the NHAI duly certified copies of the test results.

If the NHAI is satisfied with the test results, he shall notify the Service Provider in writing to that effect, and the Service Provider may then ship the equipment. If the NHAI decides that equipment is defective or produced not in accordance with the ToR, he may reject the equipment, and will inform the Service Provider of the reasons in writing within seven (7) days.

9.2.2 Defects

Should a defect be detected during one of the tests, the cause of the defect shall be ascertained and documented. For minor defects which do not require re-design of the equipment, the defect shall be rectified and the test be repeated. If a design change is required, the NHAI shall be so informed and the revised design shall be submitted to the NHAI for review and approval.

9.2.3 Test Certificate

Test certificates will be issued only for the actual equipment that has passed the tests. For sampling test of equipment, if any defect is detected in any one sample, the entire lot shall be tested and the results shall be reported to the NHAI for his review.

9.2.4 Inspection

All equipment shall be inspected before delivery and upon arrival at the site. The inspection shall be performed on the following items:

- a. Painted surfaces and color
- b. Condition of assembling
- c. Design and dimensions
- d. Parts arrangement

9.2.5 Cost of Test and Inspection

The testing cost shall cover full cost of providing all facilities, labour, consumable parts, and appliances required in connection with all inspection and tests of completion to be conducted by NHAI or its Engineer on the site or on the manufacturer's premises. Such cost shall be borne by the Service Provider.

9.3 Tests on Completion

9.3.1 General

The Service Provider shall keep a clear record of all tests conducted. The record shall include time, place, equipment, procedure, functions, persons attending, and faults or problems encountered. The test results, even if they are not satisfactory, shall be documented and submitted to the NHAI for review.

9.3.2 Tests on Completion/ Site Acceptance Test for a Portion of Works

9.3.2.1 Procedure

The Service Provider shall give due notice to the NHAI seven (7) days in advance of the proposed date and contents of the Tests on Completion for a Portion of Works.

Tests on Completion /Site Acceptance Test shall be performed for the portion of Works completed in the previous one month period.

When the NHAI has received satisfactory test results, he shall notify the Service Provider in writing that the equipment is ready for operations. If the NHAI decides the equipment is not in accordance with the ToR, NHAI may reject the equipment, and shall inform the Service Provider as to the reasons why the equipment was rejected in writing within a reasonable time. The same shall be discussed and closed during the Mid-Course Review as applicable for each phase.

9.3.3 Test Items

After the delivery and installation of the equipment at the site, tests on completion for that portion of Works shall be conducted for each of equipment.

Appearance of the equipment and required operations in standalone mode shall be examined in this test. Test items to be tested at Tests on completion are specified in the section of component systems in these specifications.

9.3.4 Testing apparatus

Each equipment shall be provided with indicator, lamp, monitor or other means to confirm normal operation of the equipment. Alternatively, the Service Provider shall provide suitable number of portable testing apparatus or computer as part of equipment. Control of monitoring the equipment shall be possible through the testing apparatus.

9.4 Tests on Completion for the Whole of Works

9.4.1 General

During the Test on Completion, all the functions of the equipment required under the Contract shall be tested. The test shall be conducted with the attendance of the NHAI and the Engineer.

9.4.2 Procedure

The Service Provider shall submit, at least seven (7) days in advance, to the NHAI the date(s) on which the Tests on Completion for the Whole Works are to be undertaken.

The Service Provider shall forward to the NHAI duly certified copies of the test results when the tests have been successfully completed. When the NHAI has received the test document and is satisfied with the test results for trial operations, he will notify the Service Provider in writing that the whole works are ready for trial operations.

If major defects are uncovered in the tests, the Service Provider shall prepare and submit to the NHAI for review and approval a proposal to remedy the defects. The Service Provider shall not take corrective actions before the proposed remedies have received the NHAI's approval. Minor faults and defects detected during the Tests on Completion may be corrected during the trial operation period.

10. Applicable Standards

The system proposed in this RFP shall be designed & installed complying minimum with the standards listed below in this chapter.

10.1 Product / Equipment related

S.No	System	Designed to conform to	Certified to standard
1	<u>Video Surveillance System (CCTV): CCTV PTZ Camera</u>	PAL, BS EN 62676-1-2, ONVIF specifications profile S & profile G, BS EN 62676-2-2, BS EN 62676-2-3	EN 61000, IEC 60068-2-27, EN 60529(IP66)
2	<u>Video Surveillance System (CCTV): Video Encoder</u>	H.264 (IEC 14496-10), EN 62676-1-2, BS EN 62676-2-2, BS EN 62676-2-3	
3	<u>Video Surveillance System (CCTV): Road-side Housing and Support Structure</u>	BS EN 12767	EN 60529 (IP56)
4	<u>Fixed CCTV Camera with Video Analytics: Fixed CCTV Camera</u>	PAL, BS EN 62676-1-2, BS EN 62676-2-2, BS EN 62676-2-3	EN 61000, IEC 60068-2-27, EN 60529 (IP66)
5	<u>Fixed CCTV Camera with Video Analytics: Fixed CCTV Camera: Road-side</u>	BS EN 12767	EN 60529 (IP56)



S.No	System	Designed to conform to	Certified to standard
	Housing and Support Structure		
6	Network Communication Infrastructure: Cable and Conduit		TEC approved
7	Network Communication Infrastructure: Protocol	IEEE 802.x	

10.2 Other relevant standards

Equipment and equipment installation shall comply with the latest revision of the applicable Bureau of Indian Standards (BIS). Only where no BIS exists for any aspect of equipment manufacture, supply, installation, identification, protection, testing or operation, then the relevant IEC or ISO standard shall apply. CEN or CENELEC standards shall apply only where no BIS, ISO or IEC standards exist.

With respect to the above some of the specific standards / Code of Practices include the latest versions of the following:

SI No	Standard	Relevant to
1	IRC SP 85	For Variable / Changeable message signs
2	IS / IEC 61508	Functional safety
3	IS 14700, CENELEC EN 50081-1: CENELEC EN 50082-1:	EMC compatibility/ EMC Emission compliance/ EMC Immunity
4	BIS 732 or BS 7671	Electrical wiring installation (BIS 732) or Wiring Regulations (BS 7671)
5	IS 2309	Lightning protection
6	IS 3043	Electrical Earthing
7	IS 5216	Safety procedures and practices in Electrical works
8	IS 7689	Control of undesirable static electricity
9	IS 694, IS 1554	PVC Insulated Cables
10	EN 61280-4-1	Fibre-Optic field test related
11	IS 14927	Cable Trunking & Ducting systems
16	EN 50173	Generic/structured cabling
17	IEC 60529	Degrees of Protection provided by Enclosures
18	IS 9000 Part XIV Sect. II	Change of temperature test
19	IEC-571; IS: 9000 Part-III Sect 3	Dry heat test
20	IS 9000 Part II Sect. III	Cold test
21	IS9000 Part V Sect. 2 Variant 1	Damp heat test (Cyclic)
22	IS9000 Part IV	Damp heat test (Steady state storage)
23	IS9000 Part XI procedure 3	Salt mist test
24	IS 9000 Part XII	Dust test



11. Interiors and Technical Furniture Control Centres (HQ, RO & Toll Plazas)

11.1 Design and functionality of technical furniture requirement

- a. Structure shall be made of 6063T6 grade Extruded Vertical & Horizontal Aluminum profiles (powder coated finish) fastened together with heavy duty MS joineries. Structure should be rigid enough to withstand BIFMA X5.5:2014 tests and desk should not be grouted during the tests. Certificate of BIFMA X5.5 (on all parameter) from an approved and reputed testing agency to be submitted to NHAI before design approval. Powder coating to pass Salt spray (FOG) test as per ASTM B 117: 600 hrs. All bolts must be SS to avoid rust and remaining hardware shall be Nickle Plated with RoHS certificate.
- b. Work-surface shall be minimum 25 mm thick MDF with High Pressure; scratch resistant Laminate (ANSI/NEMA LD3 certified). Front edge shall be moulded Polyurethane edging on profiled wooden top. Conventional T shape of PU / PVC / PP shall not be accepted as they can be pulled out manually. Desk manufacturer to be FSC certified.
- c. It is mandatory for the supplier to enclose valid test report for Seismic Zone 4 (or better) qualified console from CPRI or any government Authorised agency.
- d. Equipment Mounting: - The control desk shall house KVM equipment's/extendors, Ethernet switches, Power Distribution Unit. All the cables to be taken into the cabinet through desk legs to ensure completely hidden wire management. Desk leg shall have snap fit covers on the sides to access the wiring.
- e. Aluminum die-casted articulating Monitor arm shall be able to mount monitors complying VESA standards 75 x 75, 100 x 100, 200 x 100 & 200x200 mm. Arm shall allow rotate, tilt and raise the monitors a quick and easy manner. These arms shall be fixed on modular rear wall with help of MS Pole (height 455mm). The rear wall shall be made up of 6063T6 grade Extruded Aluminum. The wall shall be single piece per module and shall have min weight of 5 kg per meter. The wall shall be designed & connected to other modules' wall in such a way that no joints or gaps are visible in the entire width of the console. It should have linear slots running throughout the length to accept modular components. No screws should be visible when joining table top to the Slat wall.
- f. Shutters: The shutters shall be made of Preformed Textured Hot dip galvanized strips and sheets of low carbon steel coated on one side with rigid polyvinylchloride (PVC) film and on the other side a coating based on cross linkable polyester resins (sheet thickness 0.6mm & PVC Coating 0.15mm). Shutters should be supplied with high quality Foam Filter to avoid dust and dirt to enter the equipment cabinet. The shutter tile shall be ASTM E-84 (UL certified only) for surface burning characteristics. Shutters shall be of press to close type. They shall remain parallel to the table top with help of gas spring and concealed hinges, when opened. The Gas spring shall be made of steel with nickel plating. Tray type, straight panel type, conventional door designs shall not be acceptable.
- g. Side Legs: The end panels at the extreme end of consoles shall have complementing designs. leg shall be made of 18mm E1 grade MDF with thermo-fused lamination. It shall have low formaldehyde content, Density 700 kg/m³ and Fire Class: 1 as per BS 476 part 7. The legs to serve as integrated channels to route cables from floor to the cabinet. The extended foot shall be made of 2-3 mm heavy duty anodised die-cast aluminium / 2mm formed stainless steel. It shall be designed to provide access to wiring cavity for easy flow of wire from the floor to the Side aesthetic leg and then to cabinet. The leg will have inbuilt rubber grommets for safety of cables and making it rodent proof. All the fasteners should be hidden and nuts/bolts shall not be visible on the exposed surface. Leg extension shall be minimum 400 mm long.
- h. Cable Routing: Designed with vertical and horizontal cable trays to allow for continuous cable management between the cabinets.

- i. Ventilation: - Front and Rear shutters shall have hexagonal & rectangular designer perforations for provision of Airflow for cooling and heat dissipation effect.
- j. Electricals: Each console shall be equipped with individual power distribution unit. The Electrical power distribution unit shall be capable of being switched on/off and provide safe supply to all the consuming equipment individually. The console should be electrically earthed for all the body part which is conductive. Console shall be designed with vertical and horizontal cable trays to allow for continuous cable management between the cabinets.

11.2 Design parameters for Control/Command Centres interior works (HO & RO)

The scope of work also includes design, engineering, supply, installation and commissioning of 24X7 Control and Command Centre (HQ & RO) Interiors. It is imperative that the control centres are designed properly in terms of Aesthetics, Ergonomics and Functionality. Various aspects should be considered while designing to create ideal work place, considering physiological aspects such as line of sight, field of vision and cognitive factors such as concentration and perceptivity as per ISO 11064. The parameters and standards as listed below shall be adhered:

- a) It should be state-of-the-art and design should conform to provisions under ISO 14001 & OHSAS 18001, HFE and ISO9241 & ISO11064 covering various aspects of Control Room (Wall Paneling/ Partition & Ceiling), ASTM e-84 for Surface Burning Characteristics for Wall Paneling & Partition, Sound transmission class (STC) value of 35db for Wall Paneling & Partition. (according to IS: 9901 (Part III) – 1981, DIN 52210 Part IV- 1984, ISO:140 (Part III) -1995, Noise Reduction Coefficient (NRC) value is 0.30 for Ceiling – Sound Absorption Coefficient by diffuse field method; IS: 8225-1987, FSC: Forest Stewardship Council Certificate etc. Relevant details to be submitted by Service Provider before seeking design approval.
- b) Painting work & Gypsum wall or Gypsum Ceiling will not be acceptable.
- c) The interiors should be modular, scalable & sustainable.
- d) All material /finished components should be manufactured in India and rugged enough to handle 24/7, 365 days VOC's⁸ free working environment.

11.2.1 False Ceiling System

11.2.1.1 Design Requirement

The ceiling system is a combination of three types of panels viz: perforated (width 275-300mm), non-perforated (width 125-150mm) and integrated light module. Ceiling to be RoHS and ASTM E84 certified by UL/Intertek, qualified for Seismic Zone 4 or better.

The ceiling shall be designed to achieve a smooth curve along the width of the control room; with the middle portion 150mm above the sides. Curved Ceiling shall have inbuilt light module running across the length/width of the control room. The modularity shall ensure easy installation, maintenance and integration of building services like HVAC and fire detection/ fighting system. Being modular in nature, it shall be replaceable at any point of time without using any specialized tools for accessing the above ceiling services. The ceiling is designed to achieve desired acoustic levels as per ISO 11064.

The certifications shall be submitted by the Service Provider along with the solution design before commencement of the work.

⁸ Volatile organic compounds (VOC)



11.2.1.2 Design Type

All planks and light module shall be Hook on / Lay on type with locking mechanism. It shall be installed on rigid curved steel grid system to be grouted firmly to the roof. Tiles / Planks shall have hexagon perforation. The ceiling tiles shall be BIFMA M 7.1 compliant to ensure VOC emission in permissible limits. Any kind of Site cutting, chipping and gluing shall not be permitted. The tile shall be ASTM E-84 certified by UL.

11.2.1.3 Material

Hot dip galvanized strips and sheets of low carbon steel coated on one side with rigid polyvinylchloride (PVC) film and on the other side a coating based on cross linkable polyester resins (sheet thickness 0.6mm & PVC Coating 0.15mm). The entire system shall be RoHS certified. Wooden or plain colours shall be available to choose from. As an alternate, powder coated tiles with wooden / grain finish is acceptable. Post execution, acoustics levels to be verified.

11.2.1.4 Structural Support

Powder coated CRCA structure shall be securely grouted from roof with help of raw plug GI self-threaded rods. It shall be made from slotted rolled W sections (dim: 65x15x0.8mm placed at C2C of 1000 mm) and 'M' section (dim: 1.2mm thick placed at C2C 1200mm / 1500mm / 2100mm) with help of M6 cage nut and bolts. 'M' section shall have curved laser cut profile to hook-on perforated and non-perforated planks & diffused continuous LED section i.e. 'U' section (dim: 150x77x0.6mm).

11.2.2 Light Integration

The ceiling shall be designed to house uninterrupted LED lights along the total length/width of the control room. Heatsink, wiring, replacement shall be considered while designing. The light section shall be recessed approx. 75-100mm from the front facia of non-perforated ceiling panel, this is to ensure no glare. Every fifth/sixth plank shall be a through LED section. Lux levels shall be verified meeting the ISO11064 / control room requirement. Light fixtures must be suitably integrated with the ceiling planks

11.2.2.1 Dimension

All the ceiling planks shall have minimum length of 1200mm / 1800mm.

11.2.2.2 Tests & Certifications

Metal modular false ceiling is having Sound absorption coefficient (NRC) value 0.30 per IS:8225-1987, ISO: 354-1985 and ASTM 423-90.

11.2.2.3 Repair and maintenance

A bar code / identification number (IN) will be pasted on the inner side of every tile to order during the damage / technical problem / new requirement / shifting etc.

Ceiling to be RoHS and ASTM E84 certified by UL/Intertek, qualified for Seismic Zone 4 or better. The certifications shall be submitted by the Service Provider along with the solution design before commencement of the work.

11.2.3 Panelling System

11.2.3.1 Design Requirement

Paneling system to be a combination of straight, curved (radius of 15-17.5 Meters approx.) planks (2' X 6', 2' X 4') and lattice paneling (2'X 2') for aesthetic appeal. Paneling to be RoHS and ASTM E84 certified by UL/Intertek, qualified for Seismic Zone 4 or better. Curved paneling shall have inbuilt brackets to take a UDL of 500kg for mounting multiple large display units. Any other mounting arrangement shall not be allowed. Concealed &

accessible cable raceways feature of Paneling is to accommodate future expansions. It shall have infinite possibilities to incorporate equipment's, switches, junction boxes & segregate its wiring. It shall be designed to accommodate civil undulation up to 150mm in Brick walls and 50 mm in floors. Being modular in nature, it shall be replaceable at any point of time without using any specialized tools for changing the pattern and access the behind paneling services. All doors shall be integral part of the paneling system and rigidly mounted on the same structure. All junctions at ceiling and flooring shall be made of same material as that of paneling.

11.2.3.2 Design Type

Hook on / Lay on tiles with tool-less fixing & locking mechanism. It shall be a combination of perforated and non-perforated tiles installed on rigid steel structure, ensuring seismically qualified system. Perforated tiles to have overall thickness of 12.5-15mm and non-perforated of 25-30mm to break the monotony and achieve acoustic levels as per ISO11064. Acoustical infill as per ASTM 578 shall be integral part of the tile. The tile shall be ASTM E-84 certified. Perforated tiles shall have embossed perforations. A few Lattice paneling tiles shall have provision of back lit illumination at the edges. The paneling tiles shall have compliance to BIFMA M 7.1. Note: For quality in workmanship any kind of Site cutting, chipping and gluing shall not be permitted. All sharp edges shall have hemming.

11.2.3.3 Material

EN ISO 11925-2, EN 13823 certified Hot dip galvanized strips and sheets of low carbon steel coated on one side with rigid polyvinylchloride (PVC) film and on the other side a coating based on cross linkable polyester resins (sheet thickness 0.6mm & PVC Coating 0.15mm). The entire system shall be RoHS certified. Wooden or plain colors shall be available to choose from.

11.2.3.4 Structure

To be made of 1-2mm rolled/formed powder coated vertical and horizontal steel sections fastened to make a rigid frame-work. Welding at site shall not be permitted. Vertical sections shall be inserted on 3mm thick (6" high) pedestals rigidly grouted on the floor.

Repair / Maintenance / Expansion: A bar code / identification number (IN) will be pasted on the inner side of every tile to order during the damage / technical problem / new requirement / shifting etc. The certifications shall be submitted by the Service Provider along with the solution design before commencement of the work.

12. Project Design and Documentation

12.1 Responsibility for Project Design

The Service Provider shall be required to produce engineering design drawings of all Systems components / system, electrical installations and computer & data transmission network systems. Once the designs have been approved by NHAI or its appointed Consultant only then the Service Provider may commence installation works on site. It shall be the Service Provider's responsibility to ensure that all required approvals / clearance are obtained in time to meet the contractual milestones and completion date by the Service Provider. Should there be any deficiencies in the design, NHAI shall convey these to the Service Provider, and the Service Provider shall modify and resubmit the design for vetting. The maximum duration of this process shall be 15 working days and the Service Provider shall make adequate provisions for sufficient iterations of the process to acquire the required clearance. Before initiating the procurement process in each phase, the Service Provider shall submit the material approval certificate for each component for approval of NHAI in the format as prescribed in the Form T-9. The procedure of documentation is as explained below.



12.2 Documentation

12.2.1 General

The documentation shall contain complete details of how the System was actually built, and how it works, together with complete operating and maintenance information. The documentation shall consist of the following manuals and drawings:

- a. System design manual
- b. Operator's manual
- c. Software manual
- d. Hardware manual
- e. Maintenance manual
- f. As built drawing

The documentation shall be a detailed presentation with text and illustrations. All documentation shall be in English, and shall be subject to the approval by the NHAI.

The documentation process shall include the preparation, editing, and submittal for approval, publication, delivery, and acceptance of the documentation in accordance with the requirements of the Contract.

12.2.2 Presentation of Documentation

All documentation shall be prepared in a clear, concise manner with appropriate illustrations. Except otherwise specified by the NHAI, all documentation except drawings shall be prepared on A4 size sheets. All documentation shall carry an issue number, revision number, and date. A uniform style and format shall be followed as much as possible.

Two (2) printed copies and three (03) sets of electronic files on CD-ROM or DVD of all documentation, manuals, and drawings of as built conditions shall be submitted. Electronic file shall be in the latest version of portable document format. In addition, as-built drawing in the latest version of AutoCAD in .dwg format at the time of project design must be included on CD-ROM or DVD.

In order to maintain communication between parts of the Service Provider and the NHAI, documentation concerning each part of the ToR shall be produced as part of each component job and not left until the preparation of the final manuals. Effort may be saved, and familiarity with the presentation of information will be maintained by writing the documentation during the Contract in a form suitable for inclusion in the relevant final manuals.

All system manuals shall be available at the beginning of training. Re issues shall be provided if site commissioning and testing makes this necessary.

If changes or modifications are required in any of the documents previously submitted, the Service Provider shall fully describe the changes or modifications, and immediately submit them to the NHAI for approval.

12.2.3 Standard Documentation

Standard documentation shall be provided for the computer and peripherals (hardware and software), networking components, programming manuals including the languages to be used, transmission equipment, power supplies, and other standard products to be supplied under the Contract.

12.2.4 System Design Manual

The intent of the system design manual is to give an overall description of the system, digital transmission system and associated systems provided under the Contract. The manual may be divided into sections to cover all and every aspect of the systems. The description shall be plain and the detail of operation shall be left to other manuals with

adequate reference to them. The manual should provide cross references to the appropriate manuals of the system when necessary to do so.

The system design manual shall completely define all functions, inputs, and outputs including methods of entering inputs, methods of obtaining outputs, data structure and content, format, sequence, and timing. The system structure and organization shall be described including all the data flow paths through the system and all the data files in the system. This description shall clearly present the functional relationship of the computer program modules with one another and with all peripheral, monitor display, control desks, central controllers, transmission equipment, VMS, Video analytics, centre equipment, toll plaza equipment, or other equipment. An overall system flow diagram shall be provided.

12.2.5 Operator's Manual

This manual shall comprise a concise set of procedures the system operator may require to operate the system with a minimum of detailed technical description of the internal working of the various parts of the system. Cross references to the appropriate manuals for detailed technical descriptions however shall be provided.

The manual shall list specific procedures to be followed for both hardware and software operations, which may have to be followed either by programmers or hardware engineers. Instructions shall therefore be basic and detailed. A step by step procedure shall be given for switching on and off power, controlling the equipment and for starting up and shutting down the system. This shall include loading of the operating programs, checking that they are running correctly, operation of video conferencing, graphic display, and use of utility programs through keyboard and monitor display.

In addition to the routine operation, procedures shall be given for fault diagnosis. Typical symptoms shall be listed, with corresponding corrective or emergency action to be taken.

12.2.6 Software Manual

The software manual shall be project oriented. The software manual shall therefore include the application programs and database.

12.2.6.1 Structure

The manual shall describe the overall software structure with particular attention to the points at which further user programs can be interfaced. It is essential that the relationship of program modules, their priority, and their calling sequences are explained in such a manner that it may be clearly understood, especially by any competent programmer who wishes to specify or interface a new program into the system.

12.2.6.2 Program Logic/Function

Operational objectives for each program shall be described. All logic and transformations on the input data in order to generate output data and accomplish system functions shall be described, together with their interaction, sequencing, and time requirements. Derivations of any mathematical equations shall be stated if appropriate.

12.2.6.3 Flowcharts

Each major section of the programming logic as described above shall be presented in greater detail. The detail shall be developed into a format of flowcharts or other graphical methods using statement and decision blocks to show the flow of information. Within each statement and decision block sufficient information shall be presented to



describe what is being accomplished. Mathematical or engineering terminology and equations shall be incorporated when necessary to fully describe the operations to be performed.

12.2.6.4 Output Formats

Sample output formats both printout and monitor display shall be provided from actual printer output and monitor display with explanation for each item on the output format.

12.2.6.5 Data File in Database

The format of all data in the database shall be given together with the structure, type, format, length, default value, and range of allowable value, if any. For constant file that contains system parameters and constant, their value shall also be shown.

12.2.7 Hardware Manual

This manual shall provide a complete description of the hardware of all the system equipment and components to be provided under the Contract. Documents regarding component systems shall be bound in separate volume for convenience of use.

The following information shall be provided for each applicable equipment or component:

12.2.7.1 Functional Descriptions

All information necessary to fully explain the basic function or use of the equipment shall be provided. It shall include a block diagram presentation of the equipment.

12.2.7.2 Operating Procedure

The operating procedure shall be fully described in a simple and clear language. Appropriate illustrations shall be provided. Explanation and use shall be given to the all keys and switches. Meaning of all meters and indicators shall also be explained.

A list of applicable test instruments and tools required to perform necessary measurements shall be included. Setup tests and calibration procedures shall also be described if applicable.

12.2.8 Maintenance Manual

This manual shall describe both preventive and corrective maintenance procedures in such detail that maintenance personnel can perform the proper maintenance work by reading this manual.

12.2.8.1 Preventive Maintenance

The manufacturer's recommended procedures for proper preventive maintenance shall be indicated to ensure reliable equipment operation. Specifications including defined tolerances for all electrical, mechanical, and other applicable measurements and adjustments shall be listed. Periodical repainting servicing shall also be described. List of parts that require periodic replacement shall be included.

12.2.8.2 Corrective Maintenance

This section shall provide the information necessary for isolation and repair of failure and malfunctions. Accuracies, limitations, and tolerances for all electrical, physical, and other applicable measurements shall be described. Instructions for disassembly, overhaul, and reassembly, including workshop performance requirements shall be provided.

Fully detailed step by step instructions shall be given where a failure to follow special procedures would result in danger to operating or maintenance personnel, damage to the



equipment, improper operation, etc. Instructions and specifications shall be included for such maintenance work that may be accomplished by specialized technicians and engineers in a modern electro-mechanical workshop. Instructions concerning special test set up, component fabrication, use of special tools, jigs, and test equipment shall be included.

Maintenance procedures shall cover the diagnosis of faults, testing and setting up adjustments, replacements of units and operation of test equipment.

12.2.9 As-Built Drawings for Whole Works

The Service Provider shall submit three (3) copies of as-built plans and drawings to the NHAI within reasonable time after the Tests on Completion for the Whole Works but not later than one (1) months prior to the Completion. As-built plans and drawings to be submitted by the Service Provider shall include but not be limited to:

- a. Detail drawings of all equipment,
- b. CCTV camera pole, enclosure, etc. with fittings (civil structure plans and drawings),
- c. Toll Plaza equipment layout,
- d. Communication cable network diagram, fiber assignment diagram and final BOQ for the cable work
- e. Conduit route diagram, handhole, manhole layout and final BOQ for the conduit work
- f. Plaza control room, RO Control Centre, and CCC at HQ layouts,
- g. Data cable connection diagram at RCC and CCC and other,
- h. Power distribution diagram,
- i. Toll Plaza layout,

These plans and drawings shall incorporate changes made during the installation and training. A uniform legend shall be used throughout the documentation.

13. Other Works

13.1 Other Miscellaneous Works (Civil /Electrical)

The scope will also include civil, electrical, networking works required to complete erection installation/commissioning of the various subsystem / constituents and electrical and communication panels, etc. Provision of electricity connection, (toll plaza sites), and communication/network component shall be the responsibility of the Service Provider.

14. Work Area Safety and Traffic Control

14.1 General

Obstructions and excavations in the work areas shall be adequately fenced and guarded at all times and proper traffic control devices shall be installed to protect the workers and the public. Particular attention shall be paid to the positioning of traffic barriers and traffic cones. Unnecessary blocking of traffic lanes shall not be permitted. Roads and sidewalks shall not be used for the unnecessary storage of materials.

Adequate traffic control devices shall be in place before work begins and all such devices shall be removed immediately when the work is completed. As work progresses, warning devices which were appropriate at one time but are no longer applicable shall be removed immediately.

Signs, lights, barriers, and other traffic control devices shall be maintained in good order and in the correct position day and night. Signs shall be neat, clear and legible at all times.

Compensation for meeting the requirements of this section shall be included in the various Contract items and no separate payments will be made therefore.

14.2 Lane Closure

Lane closure, if required shall not be permitted on any road during peak hours except. During non-peak hours, one or several traffic lanes may be closed with prior approval of the NHAI, provided that at least one lane in each direction is open for traffic at all times. On two-way, two-lane roads, any lane closure shall be first approved by the NHAI. Notwithstanding the provisions above, the NHAI and the police shall have the power to order the lane closure removed or to require better traffic control measures.

14.3 Warning Signs

All work area warning signs shall conform to the requirements in the relevant regulations in India.

A "LANE CLOSED AHEAD" and a "LANE CLOSED" sign shall be placed upstream of the lane closure site at a distance of approximately 100 meters and 50 meters respectively when one lane of the roadway is closed. These signs shall be placed further upstream of the work area if more than one lane of the roadway is closed.

All work area warning signs shall be made of reflective sheet or material if the signs are to remain in place during hours of darkness.

14.4 Temporary Warning Flashers

Temporary warning flashers shall be used during the hours of darkness if traffic cones, barricades or other barriers are to remain in position at night. Lamps shall be kept alight at all times during the hours of darkness. The flashers shall clearly mark the site of obstructions and delineate the transition zone.

14.5 Traffic Cones

Traffic cones shall be placed on the roadway in advance of the work site to form a transition taper. The length of the transition taper shall be at least 30 meters so as to guide traffic smoothly from the full width section to the narrowed down section. Spacing between the cones shall be no more than 10 meters.

15. Time Schedule

Kindly refer provisions elaborated under the draft Contract Agreement

16. Liquidated damages/ Penalties for delays in setting up the system:

Failure by the Service Provider to complete the works during any stage of project implementation and to have remedied all reported defects within the prescribed time for commissioning and/or within the cure period prescribed shall result in imposition of the penalties for delays prescribed under liquidated damages in the Contract. The penalty will be applied @ 120% per day payable amount for corresponding location (Toll plaza/ Regional office/ Head office as applicable). The LD shall be capped up to a maximum of 10% of contract value.

- a. Once the liquidated damages reach maximum limit, NHAI may consider termination of the contract and forfeiture of the performance bank guarantee. NHAI also reserves the right to debar the Service Provider from further participation in NHAI's subsequent tenders due to its non-performance for a period decided by it.
- b. Upon termination of the Agreement due to service defaults, NHAI may choose to allocate the said site to any other Service Provider, at its sole discretion and at the risk and cost of the defaulting Service Provider.
- c. In case of delay due to reasons beyond the control of the Service Provider, upon such request from the Service Provider, NHAI may, in its sole discretion, consider suitable extension of time without imposing any liquidated damages upon the Service Provider.

17. NHAI's responsibility

NHAI will make available following to the Service Provider:

- a. Land / Space encumbrance free for installation of Systems.
- b. Assistance (if so required) from the concerned Concessionaire(s) and / or respective highway developer / operators including officers of NHAI at concerned Project Implementation Unit / Regional Office etc.
- c. Required approvals and relevant documentation from NHAI and / or other stakeholders concerned with the project stretch.
- d. Intervening / calling meetings with concerned Concessionaire(s) / SI / concerned agencies etc. on need basis to jointly discuss / finalise / brief the desired system / operational / functional requirement for achieving the desired results.

18. Service Providers Responsibility/Obligations

The Service Provider agrees and undertakes to fulfil the minimum service requirements/ obligations prescribed under **Appendix A** to ToR in this document. Broadly, these shall *inter-alia* include

- e. Setting up of an integrated solution to address the requirement under the ToR including Control Centre(s) as per requirements including all related civil and mechanical works on the highway.
- f. Coordinate with respective agencies for obtaining the necessary approvals before commencing works system installation shall be done with minimal disruption to on-going operations.
- g. Strictly comply with the prescribed timelines and technical specifications.
- h. Operating and maintaining the complete system to meet the Service Level Requirements (SLR) prescribed under ToR. Service Provider shall keep back-to-back agreements for warranty and annual maintenance support for crucial systems with their respective OEMs.
- i. Ensure that the system architecture is capable of remote monitoring. NHAI would monitor the service performed and / or status of traffic / highway administration including handling of incidence by highway patrol through real time access of Control Centre of the Service Provider through NHAI's Regional Control Centre and / or Command & Control Centre at NHAI office in New Delhi / NCR.
- j. The Service Provider shall be responsible to comply with all statutory requirements concerning the subject matter viz. compliance to Labour Laws, Tax(es), employee insurance etc. and indemnify NHAI and its employees or representative against any such claims.
- k. The Service Provider shall be responsible for arrangement and provision of all sources of electrical power and communication for setting up the complete system and providing the required services in compliance of SLR.
- l. Reporting Requirements: Providing monthly performance reports related to operations and maintenance of the complete project. Report formats will be developed in consultation with NHAI and shall include all parameters considered under SLR.
- m. Entire services envisaged under the ToR shall not be used by the Service Provider or its staff / representative for any illegal, immoral purpose and the Service Provider shall indemnify NHAI in respect of any liability incurred by Service Provider in this respect. NHAI shall not be a part to any dispute or claim what so ever between Service Provider and its contractors/sub-contractors.
- n. MPLS link provided by the Service Provider shall be used ensuring that objectionable, obscene, unauthorized or any other content, messages or communications infringing copyright, intellectual property right and international and domestic cyber laws, in any form or inconsistent with the Laws of India, are not carried in the network.

**19. Technical Resources / Personnel**

- a. The Service Provider shall form a multi-disciplinary team for undertaking this assignment. The agency shall be fully responsible to deploy its resources / personnel whose qualifications and experience fully commensurate with the task/responsibilities assigned and to achieve the objectives under the. The Personnel deployed should be experienced enough and should have proficiency in the requisite techniques / skills so as to provide practical, realistic, and actionable service.
- b. In addition, for each toll plaza and RCC as well as CCC the Service Provider will make available technical person who is adequately skilled enough to independently resolve any operational issues in the complete system and regularly interact with NHAI. Biometric Finger print reader shall be installed at each location / CC unit by the Service Provider for daily attendance management of the O&M staff.
The Service Provider shall submit the attendance record with each service invoice and Authority's Engineer shall have the access to the logs of biometric attendance management system for verification of the actual manpower working days in a month.
- c. Detailed requirement of technical resources for control centre organisation and staffing is mentioned under Appendix B to ToR.

19.1 Key Personnel

The Service Provider shall provide two key personnel, namely the Project Manager and the Team Leader with following minimum prescribed qualification and experience. The Key Personnel shall be the nodal responsible persons for fulfilling Service Provider's obligations under the Contract. They shall be involved in technical discussions as well as review meetings with NHAI.

19.1.1 Project Manager

The Project Manager shall be vested with the authority on the behalf of Service Provider to receive and carryout the directions and instructions from NHAI.

19.1.2 Team Leader

The Service Provider shall assign one (1) Team Leader who will be primarily responsible for Operation and Maintenance of setup under each Toll Plaza, RCC, and the CCC.

19.1.3 Curriculum Vitae

Within one week of the letter of the work award, the Service Provider shall submit to NHAI, detailed written statements including the names, duties, curriculum vitae of all key personnel candidates to be deputed on the project in the format prescribed below. The statements shall be duly signed by both the Service Provider and the candidates.

Sr. No.	Key Personnel	Role & Responsibilities	Minimum Qualification	Minimum Experience
1	Project Manager (1 Nos. Full time basis)	The Project Manager shall be the nodal person responsible to undertake and authorize his team members for all works under the Contract on behalf of the Service Provider. He/ She shall be given full responsibility to enter negotiations regarding all matters arising out of the Contract and fulfil the Service Provider's obligations under the Contract. The Project Manager shall be primarily full-time personnel for the execution of the Contract during entire period of the Contract validity. He/ She shall be resident in NCR	Electrical / Electronics and Communication Engineer	Total 15 Years Relevant: 10 years



Sr. No.	Key Personnel	Role & Responsibilities	Minimum Qualification	Minimum Experience
2	Team Leader (1 Nos. Full time basis)	The Team Leader shall be primarily responsible for Operation and Maintenance of complete setup under each Toll Plaza, RCC, and the CCC. He / She shall be available in Delhi / NCR whenever the necessity arises and report to NHAI whenever required.	Electrical / Electronics and Communication Engineer	Total 12 Years Relevant: 08 years

Note: Delay in submission of detailed written statements and/or mobilization of aforesaid Key Personnel shall attract penalty @ Rs. 10,000/- (Rupees Ten Thousand) per day per Key Personnel. In case the delay is more than 3 weeks, NHAI reserves the right to encash the Bid Security towards the aforesaid penalty and may proceed with the revocation of LOA or termination of the project, as the case may be.

19.1.4 Removal and/or Replacement of Personnel

- Except as NHAI may otherwise agree, no changes shall be made in the above Key Personnel. If, for any reason beyond the reasonable control of the Service Provider, it becomes necessary to replace any of the Personnel, the Service Provider shall forthwith provide as a replacement a person of equivalent or better qualifications.
- If NHAI (i) finds that any of the Personnel has committed serious misconduct or has been charged with having committed a criminal action, or (ii) has reasonable cause to be dissatisfied with the performance of any of the Personnel, then the Service Provider shall, at the Client's written request specifying the grounds therefore, forthwith provide as a replacement a person with qualifications and experience acceptable to the Client.

19.2 Sub-Contracting / Assignment

If any activity / services / infrastructure and / or any obligations in whole or in part under this project is required to be / subcontracted/ outsourced by the Service Provider, the Service Provider shall inform and seek approval of the same including the terms and condition set forth by the Service Provider in its sub-contracting agreement. For avoidance of any doubt the Service Provider shall remain solely responsible for all the works / delivery of services to NHAI under the scope of this project.

The Service Provider may sub contract the non key services such as interior and furnishing of control centre to any agencies specialised to do such work.

19.3 Performance standards

The Service Provider shall undertake to perform the services with the highest standards of professional and ethical competence and integrity. Keeping in view the sensitivity involved, the personnel deployed should maintain confidentiality / integrity at all times and work in a professional manner to protect the interest of NHAI. The firm shall promptly replace any personnel assigned under this project that NHAI considers unsatisfactory.

19.4 Standards

- Equipment and equipment installation shall comply with the latest revision of the applicable standards as specified in this document.
- The Service Provider shall ensure that the equipment supplied shall not compromise with the safety and security of the Nation under any circumstances. In case any equipment supplied / installed by the Service Provider is declared or found doubtful / unsafe/ threatful / malicious by any National/ State security agency or poses any level of threat to the security of the



Nation by sending the data to any other country through unauthorized access, entire responsibility shall vest with the Service Provider and such instances shall be dealt with as per law of the land. The Service Provider shall not procure equipment from any OEM of the country which has been under any such dispute or inquiry for unauthorized / malicious accessing of the system or sending data to any other country.

- c. NHAI accept no responsibility for errors in the Spreadsheet. All values must be verified before submission. All figures, diagrams, drawings, and BOQ are indicative and for reference purpose only, any other items as required by the bidder must be added to ensure an operational system fully complaint to the ToR requirements mentioned in this document. Bidder shall provide comprehensive list of proposed equipment/components including software and for each section
- d. NHAI reserves the right to modify this ToR in public interest, security of the Nation and proper conduct of services.



**Format of Curriculum Vitae (CV) For Proposed Staff**

Passport size
recent color
photograph of the
candidate

1. Proposed Position :

2. Name of the Candidate (in Block letters) :

3. Father's/Husband's Name :

4. (a) Date of Birth in Christian era :
(in dd/mm/yyyy format)
(Please furnish proof of age)

(b) Age as on bid due date : Yrs, ... Months &, Days

5. Permanent Address :

6. Address for Correspondence :

7. E-mail address, Phone Numbers : Email
Mobile:

8. Details of Educational Qualifications from Matriculation onwards
(Please furnish proof of qualifications)

Sl. No.	(1)	(2)	(3)	(4)	(5)
Examination passed	Year of passing	Name of College / Institute	University / Board	Main subjects	Percentage of marks obtained

9. Experience

Total Experience : Yrs, Months &, Days

Relevant Experience : Yrs, Months &, Days

**10. Details of experience of each employment (in chronological order):**

In case of change in posting held within the same employer, please fill in details separately.

1	Name and Address of the organization	Position held	Period of tenure		Responsibilities / Job Profile 1 2 3 4
			From DD/MM/YYYY	To DD/MM/YYYY	
Technical details of project experience					

2	Name and Address of the organization	Position held	Period of tenure		Responsibilities / Job Profile 1 2 3 4
			From DD/MM/YYYY	To DD/MM/YYYY	
Detailed description of project experience					

3	Name and Address of the organization	Position held	Period of tenure		Responsibilities / Job Profile 1 2 3 4
			From DD/MM/YYYY	To DD/MM/YYYY	
Detailed description of project experience					

4	Name and Address of the organization	Position held	Period of tenure		Responsibilities / Job Profile 1 2 3 4
			From DD/MM/YYYY	To DD/MM/YYYY	
Detailed description of project experience					

Note: In case of more than 4 employments, the relevant details in prescribed format be added.

**Certification by Candidate:**

- i) I am willing to work on the project and I will be available for entire duration of the project assignment and I will not engage myself in any other assignment during the currency of this assignment on the project
- ii) I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualification and experience. In case NHAI discovers anything contrary to above, NHAI would be at liberty to remove the personnel from the present assignment and debar him for an appropriate period to be decided by NHAI.
- iii) I, have not left any assignment with the consultants engaged by NHAI/ contracting firm for any continuing works of NHAI without completing my assignment. I will be available for the entire duration of the current project. If I leave this assignment in the middle of the work, I may be debarred for an appropriate period to be decided by NHAI. I have also no objection if my services are extended by NHAI for this work in future.

Signature of the Candidate

Place:

Date:

Undertaking from Service Provider

The undersigned on behalf of (name of Service Provider) certify that Shri.....(name of the proposed personnel and address) to the best of our knowledge has not left his assignment with any other firm engaged by NHAI / contracting firm for the ongoing projects. We understand that if the information about leaving the past assignment with MORT&H/NHAI without completing his assignment is known to NHAI, NHAI would be at liberty to remove the personnel from the present assignment and debar him for an appropriate period to be decided by NHAI.

Signature of the Authorized Representative

Place:

Date:

Note:

Each page of the CV shall be signed in ink by both the staff member and the Authorized Representative of the firm. Photocopies will not be considered.

**APPENDIX A to ToR - SERVICE LEVEL REQUIREMENT (SLR)****1. Service Levels Requirements and Penalties**

The Service Provider shall be responsible to ensure:

- (a) 24x7 operation of the complete system and deploy competent personnel to perform actions / operations as specified under the Service Level Requirements.
- (b) 24x7 uninterrupted availability of the complete systems, subsystems, peripherals, components commissioned under the ToR. In order to achieve this, the Service Provider shall provide adequate preventive and repair maintenance services. The Service Provider shall also maintain adequate spares at all the locations and submit the list of spares maintained at each location to the NHAI officials on monthly basis. Indicative Service Level Requirements for maintenance are prescribed in this document.
- (c) 24x7 availability of a dedicated contact centre to escalate any operational issue. Monitoring of entire process from lodging complaints upto resolutions through a CRM and generate system reports in support of SLA compliance.
- (d) Latency level of bandwidth to be monitored for < 50 ms or as prescribed under the SLA of internet Service Provider. The system shall record the logs for such events and shall be able to generate downtime reports automatically.

2. Service Level Requirements for Systems Operations

The service level requirements with respect to operations shall, include minimum following elements:

- (a) Routine monitoring of the system availability including Control Centre:
 - i) Structured and Systematic visual monitoring of the adequate working of PTZ / CCTV Cameras installed at Toll plaza.
 - ii) Traffic Monitoring on various stretches of the highway, based on measured data available from the Video Incident Detection Systems and Automatic Traffic Counter and Classifier Systems.
 - iii) Monitoring of system status including the status of individual equipment and sub-systems and alerting the maintenance team in case of any failure(s).
- (b) Incident capturing at Toll Plaza and initiating trigger to RCC at concerned Regional Office and CCC at Head Quarters:
 - i) Appropriate evaluation (based on information available via CCTV system) and initiation of trigger / prompt actions to escalate the video feed and information to concerned regional office and head office.
 - ii) CCTV coverage of incident management actions and monitoring.
- (c) Performing periodic mock trials (at least once in a month) to maintain the efficiency and effectiveness of the operations team.
- (d) The Service Provider shall provide a monthly report of the system performance.

The service level requirements with respect to operations are captured in table below:

Service Level Requirements (SLRs) with respect to System Operations

S. No	Requirement	Deliverable & Metric	Remarks
1	Routine monitoring of the status of Toll plaza traffic		
	24x7 monitoring from the Control Centre	Daily shift-wise activity logs, accounting for 24 x 7 x 365 hours of operation for a typical year	Automatic system generated report
2	Enforcement Support (if incident has taken place under the coverage area of the fixed camera(s))		



S. No	Requirement	Deliverable & Metric	Remarks
2.1	Incidents detected by the CCTV System	Provide evidence of vandalism / misbehaviour with Toll plaza staff to the enforcement agency including the following details: a) Location, Date and time stamp of such incidence b) Vehicle details in terms of vehicle class c) Video footage exclusively for the entire duration.	Automatic system generated log of action performed in the form of a report.
2.2	Detection of unsafe driving, not driving in designated lanes, driving in wrong direction, wrong parking / stopped vehicle, over dimension vehicle.	Provide support with appropriate images and video captured by the surveillance system for enforcement to the appropriate agency like Highway Patrol, etc. Provide evidence with appropriate images / data support for enforcement including date and time of incident.	Automatic system generated log of action performed, in the form of a report.
2.3	Detection of vandalism / damage to Toll plaza property / assets, spilling of hazardous material, as applicable only under the coverage area of the fixed camera.	Same as above	Automatic system generated log of action performed, in the form of a report.
3	Real Time Access to Surveillance System at NHAI's Control Centre at Regional Office / NHAI HQ		
	Accessibility of complete system on 24 x 7 x 365 basis for NHAI.	98.5% availability	Automatic System generated system availability report as measured by the Network Management System + Random remote access checks by NHAI

3. Service Level Requirements (SLR) –Systems Maintenance

The service level requirements with respect to system maintenance shall include minimum following elements:

- (i) **Scheduled/Routine Maintenance** – The Service Provider shall provide routine maintenance service on all equipment, system components, and ancillary equipment and ensure minimum required uptime for each system. The minimum required activities to be performed are given in this document.
- (ii) **Breakdown/Corrective Maintenance** – The Service Provider shall provide maintenance service in case of breakdown (i.e. repair) on all minor/ major systems, system components and ancillary equipment.



- (iii) **Software Upgrades** - From time to time Service Provider shall ensure installation of new versions of software used in the project.
- (iv) **Verify and perform System Calibration** - Calibration (*if required*) shall be performed at least once per year on relevant equipment.
- (v) **Software Support Service & Network Solution Service** – The Service Provider shall ensure Data Management, Software, and Network Solution Support.
- (vi) **Technical Support** – The Service Provider shall provide the required engineering and technical support to the operations team as and when required.

The service level requirements with respect to maintenance are captured in Table below:

Service Level Requirements (SLRs) with respect to Maintenance

No.	Unit ⁹ of System Uptime Measurement	Quarterly Availability / Uptime for entire system	Maximum Down Time during one quarter for entire system	Maximum Mean Time To Recover (MTTR) ¹⁰
1	Each Toll Plaza	98.5 %	21.7 Hrs	4 Hrs
2	Each NHAI Regional Office	98.5 %	21.7 Hrs	4 Hrs
3	NHAI Head Quarter	98.5 %	21.7 Hrs	4 Hrs

4. Performance Damages / Penalty

The Service Provider would be penalized for non-compliance in meeting SLR for Operations as well as Maintenance of the Project. Any penalty levied by NHAI or NHAI's representative shall be applicable and deducted from the quarterly payable amount. The Service Provider should enable and facilitate continuous performance measurement of entire System and not just event/incident based performance. The penalties are detailed herein under:

- 4.1 For non-compliance of SLR to maintain MTTR, penalty @ 100% of per day rate shall be imposed if MTTR exceeds the maximum permissible limit on each instance
- 4.2 For non-compliance of SLR to maintain Uptime commitment, penalty @ 120% of per day rate shall be imposed if the down time exceeds the maximum permissible on each instance.
- 4.3 For non-compliance of SLR under operations requirement, the penalty of INR 10,000 per event shall be imposed.
- 4.4 Penalty limit would be maximum 20% of the quarterly payment together with issue of warning to the Service Provider. Upon issue of third instance of warning due to non-performance/ poor performance, NHAI may consider termination of contract and forfeiture of performance bank guarantee. Decision of NHAI shall be final and no correspondence / mercy from Service Provider shall be entertained by NHAI.

5. Data Retention, Back-up and Restore Operations

- (i) Data collected shall be retained for a period of 1 month.

⁹ Individual Field Equipment / Sub-System or Network Infrastructure and Communication Systems or anything all inclusive

¹⁰ For each instance



- (ii) The backup devices and media as per current industry practice shall be provided.
- (iii) The Service Provider shall ensure adequate security measure for safeguarding of data.
- (iv) The Service Provider shall also be responsible to extract and provide data /information based on requirement of law Enforcement Agencies of Govt. of India/ State, on a case-to-case basis.

6. Spares

The Service Provider shall also maintain adequate spares at each site to address and rectify any malfunctioning / defects leading to possibility of down time. The Service Provider shall submit the list of spares maintained at each location to the NHAI officials on monthly basis.

7. Statutory and Others

NHAI shall reserve the right to get the security / compliance audit of the system done at any time through any agency appointed for the purpose and the service provide shall extend all support & cooperation for smooth conduct of said Audit.

The Service Provider shall abide by all statutory guidelines and comply with rules/ regulations framed by NHAI and/or M/o Road Transport & Highways from time to time. It shall be responsibility of the Service Provider to incorporate such changes within the stipulated time frame into the system.

The Service Provider shall comply with the guidelines and/ or Specifications and Standards including the revisions thereof issued from time to time by M/o Road Transport & Highways Govt. of India / IRC. In absence of which, the system and equipment provided by the Service Provider shall meet relevant American or European/ British standards & specifications.

8. Repair / Corrective Maintenance

This covers 24-Hours on-site service and support to respond and rectify any fault on the system reported by the NHAI or its representative or detected by the Service Provider's personnel upon inspection, to meet the uptimes defined in the Service Level Requirements. The maintenance team will solve all issues and will provide corrective maintenance Services for all break down related to any component or sub-component of the entire system.

9. Miscellaneous

Providing services of comprehensive surveillance system at the designated site shall imply that if any civil work or electrical work is required to be undertaken for installation, testing and commissioning of any equipment under the project, the same shall also be the responsibility of the Service Provider.

**APPENDIX B to ToR Control Centre Organization and Staffing**

The Service Provider shall ensure availability of skilled technical resources commensurate to the project requirement for:

- (a) Operating the system and maintaining control centre.
- (b) Address any down time/ trouble shooting as and when required at any location of service.
- (c) The resources shall be available on full time basis 365 days in the year at control centres in all regional offices and command & control centre at NHAI Head Quarter.
- (d) Final deployment of the skilled technical resources shall be subject to interview by NHAI or concurrence by NHAI.
- (e) Minimum educational qualifications and experience of the personnel to be deployed on full time basis at Control Centre is summarized below.

No	Location	No of Personnel	Minimum Qualifications	
			Educational	Work Experience
1	Toll Plazas	1 Nos. per plaza in general shift	Engineering Graduate in Electronics/ Electrical / IT/ Computer Science / or equivalent	Minimum 5 year experience in managing Control room operations / or equivalent
2	Control centre at Regional office	2 Nos. per shift of 8 hours at each regional office	Engineering Graduate in Electronics/ Electrical / IT/ Computer Science / or equivalent With CCNA certification	
3	Command & control centre at NHAI HQ	4 Nos. per shift of 8 hours	Engineering Graduate in Electronics/ Electrical / IT/ Computer Science / or equivalent With CCNP certification	

**APPENDIX C to ToR****Phase-wise breakup of locations**

Phase-I (HQ, 4 RO & 20 Plazas)					
S. No.	RO/ HQ	RO Type	Type-I Plaza	Type-II Plaza	Total
1	CCC at HQ	NA			
2	RO - Bengaluru	T-1	3	2	5
3	RO - Chandigarh	T-1	3	2	5
4	RO - Gandhinagar	T-1	3	2	5
5	RO - Jaipur	T-1	5	0	5
			14	6	20

Phase-II (8 RO & 100 Plazas)					
S. No.	RO Name	RO Type	Type-I Plaza	Type-II Plaza	Total
1	RO-Bhopal	T-1	2	10	12
2	RO-Chennai	T-1	0	16	16
3	RO-Lucknow (East UP)	T-1	2	10	12
4	RO-Vijaywada	T-1	1	11	12
5	RO-Hyderabad	T-2	3	9	12
6	RO-Kolkata	T-2	2	10	12
7	RO-Mumbai	T-2	3	9	12
8	RO-West UP	T-2	2	10	12
			15	85	100

Phase-III (10 RO & balance Plazas)					
S. No.	RO Name	RO Type	Type-I Plaza	Type-II Plaza	Total
1	RO-Nagpur	T-2	0	16	16
2	RO-Patna	T-2	0	17	17
3	RO-Bhubaneswar	T-3	0	8	8
4	RO-Delhi	T-3	1	1	2
5	RO-Guwahati	T-3	0	6	6
6	RO-Jammu	T-3	0	5	5
7	RO-Raipur	T-3	0	2	2
8	RO-Ranchi	T-3	0	4	4
9	RO-Telangana	T-3	0	4	4
10	RO-Thiruvananthapuram	T-3	0	4	4
11	<i>RO-Jaipur</i>	<i>T-1</i>	0	41	41
12	<i>RO-Chandigarh</i>	<i>T-1</i>	0	16	16
13	<i>RO-Bengaluru</i>	<i>T-1</i>	0	27	27
14	<i>RO-Gandhinagar</i>	<i>T-1</i>	2	29	31
15	<i>RO-Bhopal</i>	<i>T-1</i>	0	8	8
16	<i>RO-Chennai</i>	<i>T-1</i>	0	23	23
17	<i>RO-Lucknow (East UP)</i>	<i>T-1</i>	0	16	16
18	<i>RO-Vijaywada</i>	<i>T-1</i>	0	14	14
19	<i>RO-Hyderabad</i>	<i>T-2</i>	0	0	0
20	<i>RO-Kolkata</i>	<i>T-2</i>	0	4	4
21	<i>RO-Mumbai</i>	<i>T-2</i>	0	5	5
22	<i>RO-West UP</i>	<i>T-2</i>	0	7	7
			3	257	260

RCC of ROs at Sr. No. 11 to 22 in italics stand covered under preceding phases of project

List of Type-I Toll Plazas locations to be taken up by Service Provider

Sr.	Regional office	PIU	Project Stretch	NH	Plaza Name	Tentative Plaza Location	Latitude	Longitude	Avg. Traffic at toll plaza	No of Plaza Lane
1	RO Bengaluru	PIU Bangalore	Devanahalli - Bangalore (Km 534.720 - Km 556.84 of Bangalore - Hyderabad)	44,7	Navayuga Devanahalli / Sadahalli / Pujanahalli	Km 538.000	13.19355	77.649812	40000	24
2	RO Bengaluru	PIU Bangalore	Banglore - Neelamangla (Km 10.00 to Km 29.50)	4	Banglore - Neelamangla	km 14.855,... km 26.075	13.090749	77.400004	46442	21
3	RO Bengaluru	PIU Hospet	Hungund - Hospet (Km 202.000 to 299.000)	13	Hitnal	Km 288.000	15.323649	76.303646	33296	18
4	RO Bhopal	PIU Indore	Indore - Dewas	3	Indore Dewas (Indore side)	Km 591.000	22.959586	76.084165	34246	16
5	RO Bhopal	PIU Indore	Indore - Dewas	3	Indore Dewas (Indore Bypass)	Km 591.000	22.822692	75.938208	34246	16
6	RO Chandigarh	PIU Ambala	Panipat Elevated Highway (Km 86.000 to Km 96.000)	1	Panipat Elevated	Km 94.800	29.433664	76.97014	62000	22
7	RO Chandigarh	PIU Ambala	Panipat - Ambala	1	Gharaunda (Karnal)	Km 111.483	29.584373	76.978792	72431	19
8	RO Chandigarh	PIU Chandigarh	Zirakpur - Parwanoo	5	Chandimandir	Km 51.400	30.738834	76.897977	57815	16
9	RO Delhi	PIU Gurgaon	Delhi - Gurgaon	48	Kherki Daula	Km 42.000	28.395604	76.98176	94559	22
10	RO Gandhinagar	PIU Ahmedabad	A V Expressway Phase 1 & 2	NE-1	Ahmedabad Vadodra Expressways (Ahmedabad, Ring Raod, Nadiad, Anand, Vadodra)	Km 86.000	22.975611	72.650474	49564	18
11	RO Gandhinagar	PIU Bharuch	Vadodara - Bharuch	48	Bharthan/Karjan	Km 157.700	22.015027	73.115049	105440	18
12	RO Gandhinagar	PIU Gandhidham	Kandla - Mundra	41	Mokha	Km 44.500	22.934663	69.801655	28009	16
13	RO Gandhinagar	PIU Gandhidham	Samakhiali - Gandhidham	41	Samakhiali	Km 308.600	23.308555	70.49059	59129	16
14	RO Gandhinagar	PIU Surat (Expressway)	Gujrat/ Maharashtra Border - Surat Hazira Port	6	Bhatia	Km 89.860	21.190249	72.869085	27117	16

Sr.	Regional office	PIU	Project Stretch	NH	Plaza Name	Tentative Plaza Location	Latitude	Longitude	Avg. Traffic at toll plaza	No of Plaza Lane
15	RO Gandhinagar	PIU Surat (Expressway)	Gujrat/ Maharashtra Border - Surat Hazira Port	6	Mandal (Vyara)	Km 28.590	21.134676	73.478511	26764	16
16	RO Gandhinagar	PIU Surat (Expressway)	Bharuch - Surat	8	Choryasi	Km 245.650	21.303367	72.95418	106862	16
17	RO Hyderabad	PIU Hyderabad	Hyderabad - Vijayawada	65	Chillakallu	Km 205.025	16.885015	80.160654	20978	22
18	RO Hyderabad	PIU Hyderabad	Hyderabad - Vijayawada	65	Korlaphadu	Km 118.250	17.159677	79.474848	32495	22
19	RO Hyderabad	PIU Hyderabad	Hyderabad - Vijayawada	65	Panthangi	Km 60.650	17.232887	78.960464	49890	21
20	RO Jaipur	PIU Jaipur	Gurgaon - Kotputli - Jaipur	8	Shahjahanpur	Km 115.000	27.99978	76.430522	77559	18
21	RO Jaipur	PIU Ajmer	Kishangarh-Ajmer-Beawar	8	Pipalaz	Km 44.800	26.158466	74.371725	40672	16
22	RO Jaipur	PIU Ajmer	Kishangarh-Ajmer-Beawar	8	Gegal	Km 378.800	26.551347	74.780202	46449	16
23	RO Kolkata	PIU Kolkata	Dhankuni - Kharagpur	6	Debra	Km 112.245	22.397144	87.522855	34575	17
24	RO Kolkata	PIU Kolkata	Dhankuni - kharagpur	6	Jaladhulagori (Dhulagarh)	Km 35.250	22.57319	88.181739	61831	16
25	RO Lucknow	PIU Kanpur	Etawah - Chakeri	19	Barajod (Bara)	Km 438.000	26.386389	80.021485	43960	32
26	RO Lucknow	PIU Kanpur	Etawah Chakeri (Kanpur)	19	Anantram	Km 353.000	26.594931	79.268034	38494	24
27	RO Mumbai	PIU Pune	Pune - Satara	4	Khedshivapur	Km 819.240	18.3313849	73.8525197	77045	20
28	RO Mumbai	PIU Nashik	Pimpalgaon - Nashik-Gonde	3	Baswant (Pimpalgaon)	Km 390.450	20.141701	73.976492	37186	16
29	RO Mumbai	PIU Pune	Pune - Satara	4	Anewadi	Km 748.600	17.810312	73.971381	44022	16
30	RO Vijaywada	PIU Vijaywada	Vijayawada - Chilakaluripet	16	Kaza	Km 416.800	16.3856	80.53367	65845	16
31	RO West UP	PIU Faridabad	Badarpur Elevated Highways (Km 18.70 And Km 20.200)	2	Badarpur (plaza on main carriageway)	Km 18.70, Km 20.200	28.476208	77.305485	14923	30
32	RO West UP	PIU Faridabad	Delhi - Agra	2	Mahuvan	Km 164.000	27.337188	77.737458	36149	16

List of Type-II Toll Plazas locations to be taken up by Service Provider

Sr.	Regional office	PIU	Project Stretch	NH	Plaza Name	Plaza Location	Latitude	Longitude	Traffic at toll plaza	No of Plaza Lane
1	RO Bengaluru	PIU Bangalore	Bangalore - Kolar - Mulbagal	75	Hoskote	Km 307.700	13.059436	77.770734	77895	12
2	RO Bengaluru	PIU Bangalore	Mulbagal-AP/KNT Border (km.216.912 to 239.100)	75	Gaddurur	Km 217/450	13.194218	78.545197	17931	10
3	RO Bengaluru	PIU Bangalore	Nelamangala - Tumkur	44	Kaythsandra/ Tumkur/ Chokkanahalli	Km 61.500	13.302065	77.161956	76723	10
4	RO Bengaluru	PIU Bangalore	Mulbagal-Kolar-Bangalore section (Km 237.000 to Km 318.000)	75	Mulbagal	KM 246/750	13.148469	78.290548	6066	8
5	RO Bengaluru	PIU Bangalore	AP/ Karnataka Border - Devanhalli (Km 462.164 to Km 533.619)	7	Bagepalli	Km 464.774	13.793094	77.764384	18686	8
6	RO Bengaluru	PIU Chitradurga	Hadadi - Devgiri (Km 260.000 to Km 340.000)	4	Chalageri	Km 288.200	14.556778	75.728025	24120	14
7	RO Bengaluru	PIU Chitradurga	Doddasiddavanahally - Hadadi (Km 189.000 to Km 260.000)	48	Hebbalu	Km 237.650	14.375564	76.106875	22922	12
8	RO Bengaluru	PIU Chitradurga	Tumkur - Chitradurga	48	Guilalui	Km 172.770	14.053778	76.560573	41028	12
9	RO Bengaluru	PIU Chitradurga	Tumkur - Chitradurga including Tumkur Bypass	48	Karjeevanhalli	Km 104.530	13.612918	76.953866	49914	12
10	RO Bengaluru	PIU Chitradurga	Neelmangla - Tumkur	48	Kulumeapalya	Km 30.000	13.114638	77.37463	79712	10
11	RO Bengaluru	PIU Dharwad	Hattargi - Hirebagewadi (Km 537.000 to Km 515.000)	4	Hattargi	Km 537.770	16.1433	74.51696	36639	12
12	RO Bengaluru	PIU Dharwad	Maharashtra Border -Belgaum (Km 592.240 to Km 537.000)	4	Kognoli	Km 591.240	16.5422	74.31825	37816	12
13	RO Bengaluru	PIU Dharwad	Gabbur - Devgiri (Km 404.000 To Km 340.000)	4	Bankapur	Km 352.550	14.90999	75.2798	24190	10
14	RO Bengaluru	PIU Dharwad	Belgaum - Dharwad	4	Hirebagewadi	Km 482.600	15.76311	74.64785	26052	10
15	RO Bengaluru	PIU Gulbarga	Bijapur - Hungund	50	Nagarhalla	Km 165.650	16.292989	75.921069	20917	10
16	RO Bengaluru	PIU Gulbarga	Bijapur - Hungund	50	Kasaba (Bijapur)	Km 103.888	16.786741	75.739648	26736	10
17	RO Bengaluru	PIU Hassan	Hassan - Devihalli	75	Shanthigrama	Km 169.350	12.982709	76.228913	19025	10
18	RO Bengaluru	PIU Hassan	Hassan - Devihalli	75	Kirasave	Km 119.100	12.958304	76.623563	19136	10
19	RO Bengaluru	PIU Hassan	Neelamangla Junction - Devihalli	75	Karbylu (Bellur Cross)	Km 101.250	12.962828	76.765205	24044	10
20	RO Bengaluru	PIU Hassan	Neelamangla Junction - Devihalli	75	Doddakarenahalli (Neelmangala)	Km 32.600	13.068175	77.3605999	29348	5
21	RO Bengaluru	PIU Hospet	Hungund - Hospet (Km 202.000 to 299.000)	13	Shahapur	Km 283.500	15.357898	76.312781	19409	12

Sr.	Regional office	PIU	Project Stretch	NH	Plaza Name	Plaza Location	Latitude	Longitude	Traffic at toll plaza	No of Plaza Lane
22	RO Bengaluru	PIU Hospet	Hungund - Hospet (Km 202.000 to 299.000)	13	Vanagiri	Km 229.061	16.290681	75.923324	21949	12
23	RO Bengaluru	PIU Mangalore	Kundapur - Surathkal	66	Hazamady	Km 347.18	13.108245	74.784562	0	14
24	RO Bengaluru	PIU Mangalore	Kundapur - Surathkal	66	Gundmi	Km 300.480	13.47641	74.713082	0	10
25	RO Bengaluru	PIU Mangalore	Kundapur - Surathkal	66	Talapady	Km 16.6	12.75958	74.874087	423892	10
26	RO Bengaluru	PIU Mangalore	Surathkal - Nantoor & Nantoor Bypass (Km 358.000 to 375.300 & 1.6 Km of Nantoor ByPass)	66	Surathkal	Km 358.042	12.993098	74.792333	35080	8
27	RO Bengaluru	PIU Mangalore	B.C.Road - Padil & Padil Bypass (Km 328.000 to Km 345.00 & Km of Padil Bypass)	73	Brahamarakotlu	Km 331.290	12.875095	75.003849	31151	4
28	RO Bengaluru	PIU Ramanagara	Silk Board Junction - Hosur	44	Attibele (BETL)	Km 32.700	12.776883	77.777119	83488	14
29	RO Bengaluru	PIU Ramanagara	Silk Board Junction - Hosur	44	Elevated Section/ Electronic City	Km 18.000	12.847667	77.670866	19245	10
30	RO Bhopal	PIU Chhindwara	Multaichhindwara - Seroni (Km 0.000 to Km 75.592)	347	Chikhalikala	Km 21.00	21.841921	78.433316	1899	4
31	RO Bhopal	PIU Chhindwara	Amarwara - Narsinghpur (Km 140.000 to Km 210.010)	547	Jaitpur	Km 197.00	22.548497	79.600413	4029	4
32	RO Bhopal	PIU Chhindwara	Chindwara -Ring Road-Seoni (Km 91.066 to Km 152.351)	347	Fulara	Km 139.000	22.043538	79.418722	5156	4
33	RO Bhopal	PIU Chhindwara	Saoner - Chindwara Upto Chindwara Ring Road (Km 0.000 to Km 75.460)	547	Kelwad	Km 13.000	21.471322	78.8726	6375	4
34	RO Bhopal	PIU Guna	Guna Bypass	3	Guna Bypass	Km 331.500	24.620413	77.26147	19597	8
35	RO Bhopal	PIU Gwalior	Agra - Dholpur (Km 8.00 - Km 51)	3	Jajau (Old Baretha)	Km 28.600	26.931976	77.933397	21685	10
36	RO Bhopal	PIU Gwalior	Morana - Gwalior	3	Choundha	Km 84.000	26.467309	78.010916	29310	10
37	RO Bhopal	PIU Gwalior	Gwalior Bypass (Mehra)	3,75	Gwalior Bypass (Mehra)	Km 32.607	26.197589	78.240691	8990	8
38	RO Bhopal	PIU Indore	Khalghat MP/Maharashtra (Km 84.700 to Km 167.500)	3	Khalghat - MP/Maharashtra Border(Sendhwa, Jamli)	Km 141.850	21.75667	75.156824	31026	10
39	RO Bhopal	PIU Indore	Indore - Khalghat	3	Khalghat (Indore - Khalghat)	Km 75.700	22.173782	75.456797	42539	10
40	RO Bhopal	PIU Indore	Indore - Khalghat	3	Sonvay (Indore - Khalghat)	KM 4.000	22.607365	75.794134	35826	8
41	RO Bhopal	PIU Narsinghpur	Lalitpur - Lakhnadon	26	Malthone	Km 142.319	24.322069	78.526217	7446	8
42	RO Bhopal	PIU Narsinghpur	Lalitpur Sagar Lakhnadon	26	Bakoli	Km 357.739	23.780036	79.464288	9677	7

Sr.	Regional office	PIU	Project Stretch	NH	Plaza Name	Plaza Location	Latitude	Longitude	Traffic at toll plaza	No of Plaza Lane
43	RO Bhopal	PIU Narsinghpur	Lalitpur - Lakhnadon	26	Titerpani	Km 295.000	23.233839	79.047247	8652	4
44	RO Bhopal	PIU Narsinghpur	Km 567.550 to Km 624.480(Lakhnadon Seoni MP Border)	7	Allonia	Km 584.500	22.269661	79.54517	11875	4
45	RO Bhopal	PIU Sagar	Lalitpur - Lakhnadon	26	Chitora	Km 226.740	23.725268	78.809133	9605	8
46	RO Bhopal	PIU Shivpuri	Amola - Jhansi Bypass	27	Raksa	Km 84.650	25.461841	78.451052	12407	10
47	RO Bhopal	PIU Shivpuri	Raj/MP Boarder-Amola Vill (Shivpuri Bypass)	27	Ramnagar	Km 589.370	25.278913	77.614165	3159	8
48	RO Bhopal	PIU Shivpuri	Baran-Shivpuri-Jhansi	27	Mundiyyar	Km 525.725	25.208647	77.136059	3334	8
49	RO Bhubaneswar	PIU Berhampur	Sunakhala - Bhubaneswar (Km 362.000 to Km 286.010)	16	Gudipada (Old Gangapada)	Km 323.600	20.20348	85.668597	24733	10
50	RO Bhubaneswar	PIU Berhampur	Sunakhala - Puintola (Km 362.000 to Km 419.600)	16	Gurapalli	Km 389.609	19.638154	85.140017	18599	8
51	RO Bhubaneswar	PIU Bhubaneswar	Bhubaneswar - Puri	316	Paat Sahanipur (Pipli)	Km 21.00	20.137113	85.83902	24786	12
52	RO Bhubaneswar	PIU Bhubaneswar	Bhubaneswar - Chetia	16	Manguli	Km 34.624	20.540387	85.96387	42534	12
53	RO Bhubaneswar	PIU Bhubaneswar	Bhadrak - Balasore (Km 136.500 to Km199.141 (New Chainage Km 143.635 to Km 80.994))	16	Sergrarh	Km 97.960	21.429889	86.836645	29331	10
54	RO Bhubaneswar	PIU Bhubaneswar	Chandikhol - Paradip (Km 0.000 to Km 76.588)	5A	Srirampur	Km 3.588	20.678864	86.165581	15974	8
55	RO Bhubaneswar	PIU Bhubaneswar	Chandikhole - Bhadrak [Km 62.000 to Km 136.500 (New Chainage Km 218.000 to Km 143.500)]	16	Panikholi	Km 191.698	20.897746	86.21625	29585	8
56	RO Bhubaneswar	PIU Sambalpur	Sambalpur-Baragarh-Orisha	6	Baragarh (Barahagoda)	Km 41.00	21.35447	83.681021	19864	12
57	RO Chandigarh	PIU Ambala	Panipat - Jalandhar	1	Ladowal	Km 328.050	30.990725	75.790082	60681	12
58	RO Chandigarh	PIU Ambala	Panipat - Jalandhar	1	Sambhu(Ghaggar)	Km 211.805	30.403832	76.736825	45463	10
59	RO Chandigarh	PIU Chandigarh	Ambala - Zirakpur	152	Dappar	Km 23.080	30.527449	76.813037	47965	14
60	RO Chandigarh	PIU Chandigarh	Kurali - Kiratpur	205	Kurali (Behrampur)	Km 35.000	30.842218	76.568495	43863	12
61	RO Chandigarh	PIU Jalandhar	Amritsar - Wagah Border (Km 456.100 - Km 492.030)	1	Chiddan	Km 479.868	31.617167	74.692378	10172	10
62	RO Chandigarh	PIU Jalandhar	Jalandhar - Amritsar	1	Nijjarpura	Km 442.800	31.577704	74.997072	16218	10
63	RO Chandigarh	PIU Jalandhar	Jalandhar - Pathankot - Lakhampur	1A	Harsa Mansar	Km 84.500	32.058621	75.614278	21773	10
64	RO Chandigarh	PIU Jalandhar	Pathankot-Amritsar	54	Waryam Nangal	Km 88.500	31.731947	75.041365	23642	10
65	RO Chandigarh	PIU Jalandhar	Jalandhar - Pathankot (Km 4.23 to Km 70.00)	44	Chollang	Km 34.500	31.623756	75.640462	25581	10
66	RO Chandigarh	PIU Jalandhar	Pathankot-Amritsar	54	Ladpalwan	Km 16.000	32.197881	75.533697	27572	10

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67	RO Chandigarh	PIU Jalandhar	Jalandhar - Amritsar	1	Dhilwan	Km 410.180	31.499318	75.323065	40855	10
68	RO Chandigarh	PIU Rohtak	Rohtak - Panipat	71A	Makrauli Kalan	Km 14.600	28.944307	76.609736	19509	12
69	RO Chandigarh	PIU Rohtak	Rohtak - Bawal	71	Dighal	Km 370.420	28.776746	76.621688	21286	12
70	RO Chandigarh	PIU Rohtak	Rohtak - Bawal	71	Gangaycha Jatt	Km 430.000	28.275006	76.613363	23394	12
71	RO Chandigarh	PIU Rohtak	Rohtak - Panipat	71A	Dahar	Km 73.450	29.31922	76.918442	24953	12
72	RO Chandigarh	PIU Rohtak	Rohtak - Hisar (Km 87.00 to Km 170.00)	10	Madina Korsan	Km 99.835	28.927049	76.442169	16248	10
73	RO Chandigarh	PIU Rohtak	Delhi-Haryan -Rohtak- Hisar	10	Rohad	Km 52.460	28.754563	76.795216	27425	10
74	RO Chandigarh	PIU Rohtak	Rohtak - Hisar (Km 87.00 to Km 170.00)	10	Ramayana	Km 161.500	29.100833	75.885093	29412	10
75	RO Chennai	PIU Chennai	Chennai - Tada	5	Nallur	Km 21.625	13.216958	80.169353	50417	14
76	RO Chennai	PIU Chennai	Tirupati-Tiruthani-Chennai	205	S V puram	Km 305.800	13.525577	79.532925	9457	12
77	RO Chennai	PIU Chennai	Tambaram - Tindivanam (Km 28.000 - Km 74.500)	45	Paranur (Chengalpet)	Km 52.820	12.723887	79.981917	86953	12
78	RO Chennai	PIU Chennai	Chennai Bypass	45	Surapattu (Chennai Bypass II)	Km 28.600	13.136678	80.181624	164649	12
79	RO Chennai	PIU Chennai	Tambaram - Tindivanam (Km 74.500 - Km 121.000)	45	Athur (Tindivanam)	Km 103.500	12.346862	79.779856	57403	10
80	RO Chennai	PIU Chennai	Chennai Bypass	45	Vanagaram (Chennai Bypass)	Km 16.500	13.043526	80.149598	129563	8
81	RO Chennai	PIU Chennai	Tirupati-Tiruthani-Chennai	205	Pattaraiperumbudur (temporary TP)	Km 38.100	13.150776	79.834675	15866	6
82	RO Chennai	PIU Coimbatore	Chengapalli - Coimbatore Byepass(Km 102.035 to 144.680)	544	Kaniyur	Km 136.840	11.012827	77.073181	39026	12
83	RO Chennai	PIU Karaikudi	Trichy - Karaikudi (km 10.000 - Km 54.8000)	210	Lechchumanapatti	Km 19.000	10.624244	78.747767	14706	4
84	RO Chennai	PIU Karur	Nammakal - Karur	44	Rasampalayan	Km 259.500	11.193895	78.103219	24966	12
85	RO Chennai	PIU Karur	Trichy - Karur	81	Thirupparaithurai	Km 157.500	10.885791	78.557668	14448	6
86	RO Chennai	PIU Krishnagiri	Hosur - Krishnagiri	44	Krishnagiri	Km 87.500	12.544583	78.201132	48500	14
87	RO Chennai	PIU Krishnagiri	Walajapet - Poomalle	48	Chennasamudram	Km 104.900	12.910943	79.40121	59723	12
88	RO Chennai	PIU Krishnagiri	Krishnagiri - Walajahpet	48	Pallikonda	Km 98.520	12.905829	78.951686	49916	10
89	RO Chennai	PIU Krishnagiri	Krishnagiri - Walajahpet	48	Vaniyambadi	Km 46.800	12.648554	78.5833	53261	10
90	RO Chennai	PIU Krishnagiri	Walajapet - Poomalle	48	Nemili (Sriperumbudur)	Km 37.800	12.982155	79.968944	91814	10
91	RO Chennai	PIU Madurai	Madurai Tuticorin	45B	Eliyarpathi	Km 143.580	9.78299	78.094492	17356	12
92	RO Chennai	PIU Madurai	Madurai - Tirunelveli - Panagudi - Kanyakumari	7	Salaipudhur	Km 125.350	8.975702	77.774608	18303	12

Sr.	Regional office	PIU	Project Stretch	NH	Plaza Name	Plaza Location	Latitude	Longitude	Traffic at toll plaza	No of Plaza Lane
93	RO Chennai	PIU Madurai	Dindigul bypass - Samyanallore	7	Kodai Road	Km 398.500	10.194488	77.909317	39289	12
94	RO Chennai	PIU Madurai	Moondradaippu - Anjugramam	7	Nanguneri	Km 185.387	8.527035	77.663289	16397	10
95	RO Chennai	PIU Madurai	Madurai - Tirunelveli - Panagudi - kanayakumari	7	Kappalur	Km 18.652	9.844294	78.011209	20680	10
96	RO Chennai	PIU Madurai	Madurai Tuticorin	45B	Pudurpandiyapuram	Km 254.940	8.862935	78.117106	25978	10
97	RO Chennai	PIU Madurai	Madurai - Tirunelveli - Panagudi - kanayakumari	7	Etturvattam	Km 74.930	9.385445	77.914347	28092	10
98	RO Chennai	PIU Nagarcoil	Tirunelveli - Tuticorin (Km 0.000 - Km 47.250)	138,7A	Pudukottai (Vagaikulam)	Km 17.000	8.755472	78.065264	20047	6
99	RO Chennai	PIU Salem	Omaller - Namakkal	44	Omaller	Km 191.800	11.72034	78.07338	53218	12
100	RO Chennai	PIU Salem	Krishnagiri - Thumbipadi	44	Palayam (Dharmapuri)	Km 154.440	12.00643	78.08042	55669	12
101	RO Chennai	PIU Salem	Salem - Ulundurpet	79	Veeracholapuram (West)	Km 105.000	11.736464	79.010409	21278	10
102	RO Chennai	PIU Salem	Salem - Ulundurpet	79	Nathakkarai	Km 73.760	11.592809	78.780812	24830	10
103	RO Chennai	PIU Salem	Salem - Ulundurpet	79	Mettupatti	Km 21.750	11.66167	78.330768	29176	10
104	RO Chennai	PIU Salem	Salem - Kumarapalayam	544	Vaiguntham	Km 27.697	11.513282	77.923946	36160	10
105	RO Chennai	PIU Salem	Kumarapalayam - Chengalpalli	544	Vijaymangalmam	Km 88.287	11.245714	77.519702	50370	10
106	RO Chennai	PIU Thanjavur	Thanjavur - Trichy	67	Valavanthankottai	Km 120.900	10.744371	78.834044	40064	12
107	RO Chennai	PIU Trichy	Padalur - Trichy	45	Samayapuram	Km 307.241	10.92937	78.744056	37168	12
108	RO Chennai	PIU Trichy	Ulundurpet - Padalur	45	Thirumandurai	Km 244.000	11.396808	78.99356	38963	12
109	RO Chennai	PIU Trichy	Ulundurpet - Padalur	45	Sengurichi	Km 192.750	11.706434	79.322335	42958	12
110	RO Chennai	PIU Trichy	Trichi Bypass - Tovarankurichi - Madurai	45 B	Boothakudi	Km 21.020	10.64127	78.581277	22765	10
111	RO Chennai	PIU Trichy	Trichi Bypass - Tovarankurichi - Madurai	45 B	Chittampatti	Km 113.630	9.989594	78.244086	34457	10
112	RO Chennai	PIU Trichy	Trichy - Dindigul	45	Ponnambalapatti	Km 382.850	10.536361	78.257067	19370	8
113	RO Chennai	PIU Viluppuram	Tindivanam - Ulundurpet	45	Vikravandi(Villupuram)	Km 150.400	12.024441	79.538059	56112	12
114	RO Chennai	PIU Viluppuram	Pondicherry - Tindivanam	66	Morattandi	Km 6.572	11.983278	79.78836	15078	10
115	RO Gandhinagar	PIU Ahmedabad	Ahmedabad - Vadodara	8	Radhvanaj (Kheda)	Km 43.005	22.715971	72.740887	30536	14
116	RO Gandhinagar	PIU Ahmedabad	Ahmedabad - Vadodara	8	Vasad	Km 92.000	22.453254	73.070539	36841	14
117	RO Gandhinagar	PIU Ahmedabad	Ahmedabad - Godhra (Km 4.2 - Km 122.42 of NH - 59)	47	Vavadikhurd	Km 110.436	22.792571	73.533274	4227	10
118	RO Gandhinagar	PIU Ahmedabad	Godhra - Gujarat / MP Border	59	Bhatwada (Godhra)	Km 146.400	22.792886	73.842871	17736	10

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119	RO Gandhinagar	PIU Ahmedabad	Himatnagar - Chiloda (Km 443.00 to Km 495.00)	8	Kathpur	Km 472.035	23.410181	72.828618	28369	10
120	RO Gandhinagar	PIU Ahmedabad	A V Expressway Phase 1 & 2	NE-1	Ahmedabad Vadodra Expressways (Ahmedabad)	Km 2.600	22.975611	72.650474	49564	9
121	RO Gandhinagar	PIU Ahmedabad	A V Expressway Phase 1 & 2	NE-1	Ahmedabad Vadodra Expressways (Ring Raod)	Km 3.800	22.975611	72.650474	49564	9
122	RO Gandhinagar	PIU Ahmedabad	Ahmedabad to Godhra (Km 4.2 - Km 122.42 of NH - 59)	47	Pithai	km 37.300	22.9128	72.957428	10668	8
123	RO Gandhinagar	PIU Ahmedabad	Ratanpur - Himatnagar (Km 388.180 to Km 443.00)	8	Vantada	Km 415.00	23.61615	73.254472	20182	8
124	RO Gandhinagar	PIU Ahmedabad	A V Expressway Phase 1 & 2	NE-1	Ahmedabad Vadodra Expressways (Nadiad)	Km 43.855	22.975611	72.650474	49564	8
125	RO Gandhinagar	PIU Ahmedabad	A V Expressway Phase 1 & 2	NE-1	Ahmedabad Vadodra Expressways (Anand)	Km 58.616	22.975611	72.650474	49564	8
126	RO Gandhinagar	PIU Gandhidham	Palanpur - Radhanpur	14	Bhiladi	Km 403.000	24.143855	71.977168	15275	12
127	RO Gandhinagar	PIU Gandhidham	Palanpur - Radhanpur	14	Bhalgam (Belgaum)	Km 439.000	23.912341	71.783991	11609	10
128	RO Gandhinagar	PIU Gandhidham	Palanpur - Radhanpur	15	Makhel	Km 226.00	23.490457	70.942745	21042	10
129	RO Gandhinagar	PIU Gandhidham	Palanpur - Radhanpur	15	Varahi	Km 160.000	23.791263	71.427652	23133	10
130	RO Gandhinagar	PIU Gandhidham	Garamore - Samakhiyali (Km 254.000 to Km 306.000)(New Chaianage Km 254.537 to Km 307.034)	27	Surajbari	Km 286.655	23.233738	70.689457	45180	10
131	RO Gandhinagar	PIU Gandhidham	AbuRoad - Palanpur/Khemana (Km 264.00 to Km 295.00)	14	Undavariya/ Sirohi	Km 270.250	24.633512	72.907078	24584	8
132	RO Gandhinagar	PIU Gandhidham	Palanpur/ Khemana - AbuRoad (Km 340.00 to Km 295.00)	14	Khemana	Km 339.000	24.241335	72.462709	26280	8
133	RO Gandhinagar	PIU Rajkot	Garamore - Bamanbore (Km 182.60 to Km 254.00)	8A	Vaghasia	Km 213.100	22.42301	71.088805	23681	12
134	RO Gandhinagar	PIU Rajkot	Bhiladi - Jetpur (Km 52.5 to Km 117.6)	27,8B	Dhumiyani	Km 82.215	21.751451	70.326793	11207	10
135	RO Gandhinagar	PIU Rajkot	Porbander - Bhiladi (Km 1.960 to Km 52.500)	8B	Vanana	Km 10.755	21.664929	69.709536	12331	10
136	RO Gandhinagar	PIU Rajkot	Jetpur-Somnath(Km 0.000 to 127.600; Design Ch.0.000 to 123.45)	151,8D	Gadoi	Km 51.250	21.425234	70.295437	16726	10
137	RO Gandhinagar	PIU Rajkot	Jetpur-Somnath (Km 0.000 to Km127.600)	8D	Dari	Km 108.980	20.961287	70.334349	18711	10
138	RO Gandhinagar	PIU Rajkot	Gondal - Rajkot	8B	Pithadiya	Km 120.700	22.082642	70.781004	25494	10

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139	RO Gandhinagar	PIU Rajkot	Gondal - Rajkot	27	Bharudi	Km 156.800	21.805381	70.663976	36824	10
140	RO Gandhinagar	PIU Surat(Expressway)	Surat - Dahisar	8	Boriach	Km 297.300	20.885548	73.052162	268219	14
141	RO Gandhinagar	PIU Surat(Expressway)	Surat - Dahisar	8	Bhagwada	Km 356.200	20.43495	72.917204	261796	12
142	RO Gandhinagar	PIU Surat(Expressway)	Surat - Dahisar	8	Charoti	Km 420.340	19.890544	72.942644	66992	11
143	RO Gandhinagar	PIU Surat(Expressway)	Surat - Dahisar	8	Khaniwade	Km 470.000	19.520454	72.916883	69762	10
144	RO Guwahati	PIU Bongaigaon	Rakhaladobi - Kohora Section (Km 962.200 to Km 1023.900)	31	Dahalapara	Km 971.200	26.476288	90.712054	16930	Not Operational
145	RO Guwahati	PIU Guwahati	Nagao-Daboka-Udauli	37	Nazira Khat	Km 179.600	26.100258	91.879125	34034	Not Operational
146	RO Guwahati	PIU Nagaon	Nagao-Daboka-Udauli	36	Daboka	Km 15.652	26.114657	92.875479	11871	Not Operational
147	RO Guwahati	PIU Nagaon	Nagao-Daboka-Udauli	37	Raha(Saragaon)	Km 254.514	26.245678	92.541521	16956	Not Operational
148	RO Guwahati	PIU Shillong	Jorabat - Shillong (Barapani) (Km 0.000 to Km 61.840)	40	Pahammawlein	Km 13.550	25.99328	91.860491	15209	7
149	RO Guwahati	PIU Shillong	Shilong bypass	44	Deingposah	Km 24.700	25.648846	92.047612	7057	6
150	RO Hyderabad	PIU Hyderabad	Kothakota bypass - Kurnool (Km 135.469 to Km 211.00)	44	Pullur	Km 200.95	15.887742	78.016978	34701	10
151	RO Hyderabad	PIU Hyderabad	Hyderabad - Dindi (km 23.000 - km 78.000)	765	Kadthal	Km 45.71	16.985586	78.50172	0	5
152	RO Hyderabad	PIU Hyderabad	Hyderabad - Dindi (km 23.000 - km 78.000)	765	Konetipuram	Km 101.45	16.608082	78.677722	0	5
153	RO Hyderabad	PIU Nirmal	Maharashtra/AP Border - Islam Nagar(Km 175.000 to Km 230.000)	44	Pippalwada	Km 180.330	19.781093	78.565772	11518	12
154	RO Hyderabad	PIU Nirmal	Islam Nagar - Katdal (Km 230.00 to 278.00)	44	Rolmamda	Km 245.400	19.28019	78.409222	12708	12
155	RO Hyderabad	PIU Nirmal	Kadhal - Armur (Km 278.00 to Km 308.00)	44	Gamjal	Km 281.320	19.026592	78.362705	18117	12
156	RO Hyderabad	PIU Nirmal	Nagpur - Hyderabad (Km 308.000 to Km	44	Indalwai	Km 342.700	18.538266	78.239734	22448	12

Sr.	Regional office	PIU	Project Stretch	NH	Plaza Name	Plaza Location	Latitude	Longitude	Traffic at toll plaza	No of Plaza Lane
			367.000)							
157	RO Hyderabad	PIU Nirmal	Adloor Yellaready - Chegunta (Km 368.255 to Km 419.793)	7	Bhiknoor	Km 392.600	18.205251	78.398261	17677	8
158	RO Hyderabad	PIU Nirmal	Chegunta - Bewenpally (Km 419.793 to Km 481.331)	44	Manoharabad	Km 443.713	17.801103	78.471683	23254	6
159	RO Jaipur	PIU Ajmer	Lambia - Raipur	458	Lilamba	Km 216.327	26.084278	74.001389	0	6
160	RO Jaipur	PIU Ajmer	Nimbijodha Degna Merta City (0.000 139.900)	458	Banthadi	Km 34	27.275167	74.351659	0	6
161	RO Jaipur	PIU Ajmer	Nimbijodha Degna Merta City (0.000 139.900)	458	Tamdoli	Km 93.5	26.870978	74.293475	0	6
162	RO Jaipur	PIU Ajmer	Bheem - Gulabpura - Parasoli ByPass	148D	Para	Km 34.500	25.788339	74.338933	5826	6
163	RO Jaipur	PIU Barmer	Bagundi - Barmer (km 254.800 to km 328.900)	25	Nimbaniya Ki Dhani (Bayatu)	Km 300.300	25.865638	71.616734	3200	6
164	RO Jaipur	PIU Chittorgarh	Kishangar- (Kanwalias) Bhilwara (Km 0.000 to Km 35.000 & Km 15.000 to Km 81.000)	79	Kanwalias	Km 80.800	25.756696	74.630935	49697	14
165	RO Jaipur	PIU Chittorgarh	Bhilwara - Chittorgarh (Km 81.000 to Km 163.900)	79	Jojro Ka Khera	Km 163.650	25.082922	74.624379	48748	12
166	RO Jaipur	PIU Chittorgarh	Chittorgarh - Kota	76	Bassi	Km 237.629	25.033921	74.817676	10168	10
167	RO Jaipur	PIU Chittorgarh	Chittorgarh - Kota	76	Dhaneshwar	Km 340.979	25.072621	75.598467	11617	10
168	RO Jaipur	PIU Chittorgarh	Chittorgarh Bypass (Km 159.000 On NH-79 & Km 213.000 of NH-76)	79	Rithola	Km 28.500	24.85008	74.582152	38776	10
169	RO Jaipur	PIU Chittorgarh	Rajsamand Bhilwara	758	Rupa Kheda	Km 18.000	25.110565	73.988241	0	8
170	RO Jaipur	PIU Chittorgarh	Rajsamand Bhilwara	758	Mujras	Km 78	25.274995	74.492879	0	8
171	RO Jaipur	PIU Chittorgarh	Chittorgarh - Kota	76	Aroli	Km 294.469	25.09118	75.199063	9900	6
172	RO Jaipur	PIU Dausa	Bharatpur - Mahua ((Km 62.295 to Km 119.600)	11	Ludhawai	Km 64.570	27.178509	77.416845	26802	12
173	RO Jaipur	PIU Dausa	Bharatpur - Mahua (Km 63.000 to Km 120.000)	11	Amoli	Km 98.500	27.101301	77.090874	24613	10
174	RO Jaipur	PIU Dausa	Karauli - Dholpur (Km 83.960 - Km 184.860)	11B	Chila Chond	Km 142.35	26.613002	77.515359	0	8
175	RO Jaipur	PIU Dausa	Karauli - Dholpur (Km 83.960 - Km 184.860)	11B	Konder	91.8	26.537213	77.086068	0	8
176	RO Jaipur	PIU Dausa	Agra - Bharatpur	21	Korai	Km 30.090	27.114895	77.715981	19846	8
177	RO Jaipur	PIU Dausa	Mahua - Jaipur (Km 120.000 to Km 228.000)	21	Sikandra	Km 156.600	26.944488	76.557567	30923	8
178	RO Jaipur	PIU Dausa	Mahua - Jaipur (Km 120.000 to Km 228.000)	21	Rajadhok	Km 204.700	26.859184	76.105596	31261	8

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179	RO Jaipur	PIU Jaipur	Jaipur - Kishangarh	8	Thikariya (Jaipur)	Km 286.700	26.843328	75.615578	89909	14
180	RO Jaipur	PIU Jaipur	Jaipur - Kishangarh	8	Kishangarh (Badgaon)	Km 360.700	26.595329	74.939169	111061	14
181	RO Jaipur	PIU Jaipur	Gurgaon - Kotputli - Jaipur	8	Manoharpur	Km 211.000	27.3056399	75.9535128	64980	12
182	RO Jaipur	PIU Jaipur	Jaipur - Deoli	52	Barkheda (Chandlai)	Km 30.500	26.68816	75.904726	30098	10
183	RO Jaipur	PIU Jaipur	Gurgaon - Kotputli - Jaipur	8	Daulatpura	Km 241.000	27.0868994	75.8345568	58687	10
184	RO Jaipur	PIU Jaipur	Jaipur- Deoli (new)	52	Sonwa (Sonva)	Km 105.000	26.109852	75.744832	12885	8
185	RO Jaipur	PIU Kota	Deoli - Kota	52	Kishorpura	Km 180.00	25.17025	76.130522	18136	14
186	RO Jaipur	PIU Kota	Kota - Baran Section	76	Fatehpur	Km 461.290	25.122	76.572806	9515	8
187	RO Jaipur	PIU Kota	Kota - Baran Section	27	Simliya	Km 409.680	25.170089	76.130552	12970	8
188	RO Jaipur	PIU Kota	Jhalawar-Rajasthan/M.P.Border (Km 346.540 to Km Km 408.700)	52	Methoon	Km 376.180	24.420042	76.503896	5762	6
189	RO Jaipur	PIU Pali	Beawar-Pali-Pindwara	14	Indranagar	Km 93.750	25.828286	73.45492	24995	12
190	RO Jaipur	PIU Pali	Beawar-Pali-Pindwara	14	Birami	Km 154.00	25.371114	73.201486	30914	12
191	RO Jaipur	PIU Pali	Beawar-Pali-Pindwara	14	Raipur	Km 27.50	26.063535	74.05947	23631	10
192	RO Jaipur	PIU Pali	Beawar-Pali-Pindwara	14	Uthamam	Km 202.315	25.033571	72.94353	30100	10
193	RO Jaipur	PIU Sikar	Jaipur-Reengus	52	Tatiyawas	Km 257.00	27.089775	75.7415	35989	14
194	RO Jaipur	PIU Sikar	Reengus - Sikar (Km 298.075 to Km 341.047)	52	Akhepura	Km 324.638	27.50603	75.348401	19589	12
195	RO Jaipur	PIU Udaipur	Gomti Churaha - Udaipur	8	Mandawada (Gomati)	Km 187.244	25.20385	73.814701	13117	12
196	RO Jaipur	PIU Udaipur	Gomti Churaha - Udaipur	8	Negadiya	Km 238.170	25.704011	74.061836	21997	12
197	RO Jaipur	PIU Udaipur	Rithola - Chittorgarh (Km 113 to Km 213)	76	Narayanpura	Km 166.000	24.613529	74.233079	23822	12
198	RO Jaipur	PIU Udaipur	Kherwara - Ratanpur (Km 348.000 to Km 388.180)	8	Khandi Obari	Km 348.450	23.993636	73.627895	36359	12
199	RO Jaipur	PIU Udaipur	Pindwara - Jaswantgarh	76	Malera	Km 11.200	24.712368	73.093755	7703	10
200	RO Jaipur	PIU Udaipur	Jaswantgarh - Debari	76	Gogunda (Jaswantgarh)	Km 64.200	24.766166	73.523999	9666	10
201	RO Jaipur	PIU Udaipur	Udaipur - Kherwara (Km 278.000 to Km 348.000)	8	Paduna	Km 311.100	24.271438	73.67379	35716	10
202	RO Jammu	PIU Jammu	Jammu - Pathankot	44	Lakhanpur/ Rajbagh	Km 16.400	32.382605	75.598788	27011	Not Operational

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203	RO Jammu	PIU Jammu	Samba - Kunjwani	44	Thandikhui	Km 88.300	32.607394	74.944346	39483	Not Operational
204	RO Jammu	PIU Jammu	Jammu Bypass - Udampur (Km 15.000 to Km 67.000)	44	Bann	Km 22.600	32.838928	74.940536	20665	10
205	RO Jammu	PIU Jammu	Chenani - Nashri	1A	Mada	Km 90.176	33.024637	75.252118	0	4
206	RO Jammu	PIU Jammu	Chenani - Nashri	1A	Nashri	99.8	33.174771	75.303421	0	4
207	RO Kolkata	PIU Durgapur	Panagarh - Palsit (Km 520.103 - Km 587.853)	2	Palsit	Km 585.692	23.178722	88.026395	33551	12
208	RO Kolkata	PIU Durgapur	Palsit - Dhankuni (Km 587.853 - Km 651.602)	2	Dankuni	Km 646.005	22.698891	88.288862	40610	12
209	RO Kolkata	PIU Durgapur	Barwa Adda - Panagarh	2	Beliyad	Km 438.500	23.763627	86.79803	19758	7
210	RO Kolkata	PIU Jalpaiguri	Salsalabari - Assam Bengal Border (Km 228.000 - Km 254.500)	31C	Guabari	Km 243.00	26.476592	89.756535	14238	14
211	RO Kolkata	PIU Jalpaiguri	Sonapur - Ghoshpukur (Km 551.000 - Km 507.000)	31	Paschim Madati	Km 547.350	26.568967	88.275366	16489	14
212	RO Kolkata	PIU Jalpaiguri	Dalkhola - Islampur (Km 447.00 - Km 498.970)	31	Surjapur	Km 451.00	25.933485	87.843205	22601	8
213	RO Kolkata	PIU Karur	Karur Bypass - Dindigul bypass	44	Valanchettiyur	Km 338.000	10.194266	77.909368	25509	14
214	RO Kolkata	PIU Karur	Trichy - Karur	67	Manavasi	Km 198.500	10.930934	78.215268	28157	10
215	RO Kolkata	PIU Kolkata	Kolaghat - Haldia (Km 0.500 - Km 52.700)	41	Sonapetya	Km 11.600	22.335479	87.869477	31822	12
216	RO Kolkata	PIU Kolkata	Second Vivekananda Bridge & Approach	2	Nivedita Setu	Km 654.059	22.654373	88.325118	47189	12
217	RO Kolkata	PIU Malda	Baharampur - Farakka (Km 191.416 to Km 294.684)	34	Gopgram (Shibpur)	Km 206.562	24.150449	88.18629	18229	14
218	RO Kolkata	PIU Malda	Baharampur - Farakka (Km 191.416 to Km 294.684)	34	Kishorpur (Chandernore)	Km 260.850	24.563182	88.019993	23013	14
219	RO Kolkata	PIU Malda	Farakka - Raiganj (km 295.000 - km 398.000)	34	Lakshmipur	Km 297.867	24.822455	87.966864	856421	14
220	RO Kolkata	PIU Malda	Farakka - Raiganj (km 295.000 - km 398.000)	34	Chakseherdi (Gajol) Bagsarai	Km 351.440	25.195872	88.182566	875568	14
221	RO Lucknow	PIU Allahabad	Allahabad Bypass	30	Allahabad Bypass (Khokhranj, Nawabganj, Soraon, Sahson & Handia)	Km 161.850, Km 185.544, Km 196.605, Km 216.815, Km 239.950	25.558856	81.772125	0	10
222	RO Lucknow	PIU Allahabad	Allahabad - Handia - Varanasi (Km 245.00 to Km 317.389)	30	Lalanagar	Km 279.120	25.266948	82.491513	28088	6

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223	RO Lucknow	PIU Allahabad	Km 0.00 (211.700 on NH-2) - to km 5.410(New Aligment of NH-27)	30	Cable Stayed Naini Bridge	Km 1.600	25.41629	81.861017	44368	6
224	RO Lucknow	PIU Gorakhpur	Gorakhpur Bypass	28	Tendua (Gorakhpur Bypass)	Km 256.500	26.724015	83.274398	14059	10
225	RO Lucknow	PIU Gorakhpur	Ayodhya - Gorakhpur	28	Mandawnagar	Km 198.000	26.810525	82.731283	30344	10
226	RO Lucknow	PIU Gorakhpur	UP/ Bihar Border - Kasia	28	Salemgarh	Km 361.902	26.631703	84.238336	70550	10
227	RO Lucknow	PIU Gorakhpur	Gorakhpur - Kasiya	28	Muziana Hetim	Km 313.372	26.733855	83.808555	22816	8
228	RO Lucknow	PIU Gorakhpur	Ayodhya - Gorakhpur	28	Chaukadi	Km 163.000	26.781312	82.417008	33555	8
229	RO Lucknow	PIU Kanpur	Chakeri - Usrania (Km 483.687 to Km 564.897)	2	Badauri	Km 527.275	26.126972	80.585425	2352	8
230	RO Lucknow	PIU Kanpur	Kanpur-kabrai	86	Khanna	km 105.500	25.543293	80.060095	11698	8
231	RO Lucknow	PIU Kanpur	Kanpur - kabrai	86	Aliyapur	Km 43.500	26.069752	80.163011	20242	8
232	RO Lucknow	PIU Kanpur	Orai Barah	25	Usaka (Chamari)	Km 229.913	26.036608	79.577976	21989	8
233	RO Lucknow	PIU Kanpur	Rampur - Thariwan - Khokharaj (km 94.145 to km 158)	2	Katoghan	Km 120.500	25.749487	81.170481	23244	5
234	RO Lucknow	PIU Kharagpur	Baleshwar - Kharagpur	60	Laxmannath	Km 52.000	13.1955	77.652944	10347	10
235	RO Lucknow	PIU Kharagpur	Baleshwar - Kharagpur	60	Rampura	Km 103.500	22.24076	87.39207	13585	10
236	RO Lucknow	PIU Lucknow	Lucknow - Sitapur (413.200 - 488.270)	30	Itunja (Barabhari)	Km 467.00	27.503818	80.752729	30053	12
237	RO Lucknow	PIU Lucknow	Kanpur - Ayodhya	25	Nawabganj	Km 39.000	26.623172	80.694765	46719	12
238	RO Lucknow	PIU Lucknow	Kanpur - Ayodhya	28	Ahmedpur	Km 53.000	26.858314	81.422445	183764	12
239	RO Lucknow	PIU Lucknow	Lucknow - Raebarilly (Km 12.700 to Km 82.700)	24B, 30	Dakhina Sekhpur	Km 42.550	26.524482	81.066094	24215	10
240	RO Lucknow	PIU Lucknow	Lucknow - Sitapur (413.200 - 488.270)	30	Khairabad (Karondi)	Km 420.00	27.558744	80.661034	25690	10
241	RO Lucknow	PIU Lucknow	Kanpur - Ayodhya	28	Ronahi	Km 107.000	26.763728	82.006302	32254	10
242	RO Lucknow	PIU Lucknow	Km 42.546 to Km 93.037(Jarwal to Bahraich ByPass)	28C	Aaini	Km 63.450	27.292105	81.54465	11001	6
243	RO Lucknow	PIU Lucknow	Km 99.00 to Km 152.847(Bahraich ByPass to Rupadih)	28C	Gulalpurva	Km 125.200	27.825548	81.527252	11696	6
244	RO Lucknow	PIU Mathura	Ghaziabad - Hapur & Hapur Bypass (Km 27.643 to Km 48.638 & ByPass of Km 11.250)	9	Dasna	Km 29.300	28.684924	77.522471	81110	10
245	RO Lucknow	PIU Raibareilly	Raibareilly- Jaunpur (Km 0.000 to Km 86.000)	231	Nuruddinpur	Km 40.000	26.035838	81.43825	6605	6
246	RO Lucknow	PIU Raibareilly	Raibareilly- Jaunpur (Km 86.00 to Km 166.400)	231	Kunwarpur	Km 132.400	25.674873	82.32499	8452	6

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247	RO Mumbai	PIU Nashik	Khed - Sinnar (Km 42.000 - Km 177.000)	60 (Old 50)	Hivargaon Pavsa	Km 138.749	19.516452	74.201583	19600	12
248	RO Mumbai	PIU Nashik	Khed - Sinnar (Km 42.000 - Km 177.000)	50	Chalakhwadi	Km 91.106	19.170738	74.074993	22000	12
249	RO Mumbai	PIU Nashik	MP/Maharashtra Border - Dhule	3	Shirpur	Km 205.000	21.319718	74.889291	31750	12
250	RO Mumbai	PIU Nashik	MP/Maharashtra Border - Dhule	3	Songir	Km 244.500	21.050995	74.785116	42113	12
251	RO Mumbai	PIU Nashik	Pimpalgaon - Dhule	3	Chandwad	Km 356.700	20.325014	74.210751	13819	10
252	RO Mumbai	PIU Nashik	Pimpalgaon - Dhule	3	Laling (Dhule)	Km 268.632	20.833054	74.754192	38054	10
253	RO Mumbai	PIU Nashik	Vadape - Gonde	3	Arjunali	Km 532.690	19.361481	73.165874	47187	10
254	RO Mumbai	PIU Nashik	Vadape - Gonde	3	Ghoti	Km 455.485	19.708905	73.614819	67924	10
255	RO Mumbai	PIU Pune	Pune - Solapur Pkg. I (km 40 - 144.400)	9	Patas	Km 65.000	18.424491	74.466193	24598	14
256	RO Mumbai	PIU Pune	Pune - Solapur Pkg. I (km 40 - 144.400)	9	Sardewadi / Indapur	Km 140.100	18.844903	73.09453	25222	12
257	RO Mumbai	PIU Pune	Satara - Kagal	4	Kini	Km 634.500	16.8767054	74.2983001	39349	8
258	RO Mumbai	PIU Pune	Satara - Kagal	4	Tasawade	Km 694.150	17.365756	74.122928	46028	8
259	RO Mumbai	PIU Solapur	Pune - Solapur Pkg. II (km 144.400 - km 249.000)	9	Sawaleshwar	Km 229.350	17.764629	75.75589	24638	12
260	RO Mumbai	PIU Solapur	Pune - Solapur Pkg. II (km 144.400 - km 249.000)	9	Varwade	Km 178.572	17.957588	75.331066	34056	12
261	RO Nagpur	PIU Amravati	Nagpur - Kondhali	53	Gondhkhairi/ Kondhali	Km 20.612	21.137001	78.89666	13249	10
262	RO Nagpur	PIU Amravati	Talegaon - Amravati	53	Nandgaon Peth	Km 142.800	20.951008	77.788359	20623	10
263	RO Nagpur	PIU Amravati	Kondhali - Talegaon	53	Karanja (Ghadge)	Km 76.130	21.162103	78.399287	13376	8
264	RO Nagpur	PIU Bilaspur	Durg Bypass - Chhattisgarh/Maharashtra Border	6	Durg Bypass (Dhamdanaka)	Km 312.780	21.214518	81.287962	20742	10
265	RO Nagpur	PIU Bilaspur	Chhattisgarh/Orissa Border - Aurang Section	6	Dhank	Km 182.636	21.226901	82.422438	12532	8
266	RO Nagpur	PIU Bilaspur	Chhattisgarh/Orissa Border - Aurang Section	6,53	Chhuhipali	Km 123.206	21.299829	82.94286	12766	8
267	RO Nagpur	PIU Bilaspur	End of Durg Bypass - Chhattisgarh / Maharashtra Border	53	Thakurtola (End of Durg Bypass)	Km 331.865	21.117914	81.122298	22246	8
268	RO Nagpur	PIU Nagpur	Nagpur - Saoner - Betul (Km 3.00 to Km 59.300 and Km 137.00 Km 257.400)	69	Khambara	Km 71.050	21.693812	78.387824	5453	12
269	RO Nagpur	PIU Nagpur	Nagpur - saoner - Betul (Km 3.000 to Km 59.300 and Km 137.000 Km 257.401)	69	Milanpur	Km 14.700	21.864457	77.961508	9684	12

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270	RO Nagpur	PIU Nagpur	Km. 498.000 to Km. 544.200(Nagpur-Wainganga)	6	WEPL Mathani	Km 523.400	21.139545	79.365105	30717	12
271	RO Nagpur	PIU Nagpur	MP/Maharashtra Border - Nagpur Section	7	Mansar (Kamptee - Kanhan Bypass)/ Tekadi	Km 690.600	21.382332	79.253327	17435	8
272	RO Nagpur	PIU Nagpur	Chattisgarh/Maharashtra Border - Wainganga Bridge	6	Sendurwafa	Km 449.260	21.088119	80.032855	19575	8
273	RO Nagpur	PIU Nagpur	Borkhedi - Wadner	7	Daroda	Km 92.500	20.450467	78.755153	9739	6
274	RO Nagpur	PIU Nagpur	Nagpur - Saoner - Betul (Km 3.000 to Km 59.300 and Km 137.000 Km 257.402)	69	Patanswangi	Km 25.700	21.343724	79.009038	11802	6
275	RO Nagpur	PIU Nagpur	MP/Maharashtra Border - Nagpur Section	7	Borkhedi (Nagpur ByPass)	Km 35.600	20.85612	78.963632	18342	6
276	RO Nagpur	PIU Nagpur	Deodhari - Kelapur (Km. 123.000 to Km. 153.600)	7	Kelapur	Km 150.000	20.019307	78.54022	11404	4
277	RO Patna	PIU Begusarai	Khagaria - Purnea (Km 270.000 - Km 410.000)	31	Maranga	Km 397.885	25.728646	87.458249	18206	6
278	RO Patna	PIU Begusarai	Khagaria - Purnea (Km 270.000 - Km 410.000)	31	Kharik	Km 333.150	25.385796	87.01154	19567	6
279	RO Patna	PIU Begusarai	Mokama - Munger (Km 1.43 - Km 70.00)	80	Balgudar	Km 23.500	25.250014	86.034744	7866	4
280	RO Patna	PIU Chappra	Hajipur - Muzaffarpur	77	Saidpur Patedha	Km 12.687	25.802861	85.283461	19724	10
281	RO Patna	PIU Darbhanga	Forbesganj - Purnea	57	Hariabara	Km 244.860	26.152636	87.445216	13180	12
282	RO Patna	PIU Darbhanga	Darbhanga - Kosi Bund	57	Raje(Old Naraur)	Km 88.000	26.225984	86.153489	16327	12
283	RO Patna	PIU Darbhanga	Muzaffarpur - Darbhanga - Purnea	57	Maithi	Km 26.200	26.112648	85.564827	16580	12
284	RO Patna	PIU Darbhanga	Muzaffarpur - Barsoni (km 519.600 - km 627.000)	28	Govindpur	Km 602.200	25.590289	85.875945	950724	10
285	RO Patna	PIU Darbhanga	Kotwa - Mehshi - Muzaffarpur (Km 440.000 - Km 520.000)	28	Parsoni Khem	Km 468.700	26.451663	85.022711	16530	8
286	RO Patna	PIU Darbhanga	Muzaffarpur - Barsoni (km 519.600 - km 627.000)	28	Mahanth Maniyari	Km 534.669	26.038799	85.447437	591048	8
287	RO Patna	PIU Darbhanga	Muzaffarpur - Sonbarsa (Km 2.800 - Km 89.000)	77	Runni	Km 26.090	26.373615	85.493984	9378	6
288	RO Patna	PIU Darbhanga	Phulparash - Forbesganj	57	Asanpur	Km 150.390	26.299831	86.630217	10717	6
289	RO Patna	PIU Patna	Patna - Bakhtiyarpur	30	Deederganj	Km 194.00	25.570828	85.247807	53214	12
290	RO Patna	PIU Purnia	Purnea - Dalkola (Km 410.700 - Km 447.000)	31	Barsoni	Km 416.000	25.804671	87.59074	19071	8
291	RO Patna	PIU Varanasi	Varanasi - Aurangabad	2	Mohania	Km 860.000	25.19093	83.559544	31000	14
292	RO Patna	PIU Varanasi	Varanasi - Aurangabad	2	Sasaram	Km 907.100	24.957125	83.954997	30329	12

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293	RO Patna	PIU Varanasi	Varanasi - Aurangabad Section	2	Dhafi	Km 800.430	25.248275	82.994017	37932	12
294	RO Raipur	PIU Raipur	Raipur - Aurang	53	Lakholi	Km 242.800	21.20296	81.905328	19047	8
295	RO Raipur	PIU Raipur	Raipur - Aurang	53	Sundar Nagar	Km 276.135	21.229353	81.607029	51166	8
296	RO Ranchi	PIU Dhanbad	Barachetti - Gorhar (Km 240.00 - Km 320.00)	19	Rasoiya Dhamna	Km 279.425	24.3234	85.3881	30985	6
297	RO Ranchi	PIU Dhanbad	Aurangabad - Barachatti(Km 180.00 to Km 240.00)	19	Saukala (Sawkala)	Km 200.100	24.599579	84.70284	34735	6
298	RO Ranchi	PIU Dhanbad	Gorhar - Barwa Adda (Km 320.00 - Km 398.750)	19	Ghanghri	Km 346.100	24.030104	85.948614	10075	4
299	RO Ranchi	PIU Ranchi	Hazaribagh - Ranchi (Km 40.500 - Km 114.000)	33	Pundag	Km 98.930	23.542635	85.503153	20050	6
300	RO Telangana	PIU Hyderabad	Jacherla - Kotakatta (Km 80.050 to Km 135.740)	44	Shakhapur	Km 114.850	16.535645	77.944453	33659	14
301	RO Telangana	PIU Hyderabad	Thondapali - Jedcherla(Km 22.300 to Km 80.306)	44	Raikal	Km 54.290	17.005867	78.194493	45069	10
302	RO Telengana	PIU Khammam	Tannamcherla - Jamandlapally (km 72.600 - km 121.000)	365	Chinthapally	Km 99.75	17.471578	79.980527	0	6
303	RO Telengana	PIU Warangal	Hyderabad Yadgiri Section	163	Gudur (Hyd-Yadgiri)	Km 38.100	17.485724	78.8217	36470	13
304	RO Thiruvananthapuram	PIU Cochin	Kalamassery - ICTT Vallarpadam	966A, 47C	Ponnarimangalam	Km 12.750	10.010336	76.257977	16392	Not Operational
305	RO Thiruvananthapuram	PIU Cochin	Edapally - Vytilla - Aroor Section (Km 342.00 to Km 358.750)	66	Kumbalam	Km 356.500	9.89525	76.313542	59351	8
306	RO Thiruvananthapuram	PIU Palakkad	Thrissur - Angamali - Edapalli	544	Paliyekkara	Km 278.000	10.442868	76.260179	70003	12
307	RO Thiruvananthapuram	PIU Palakkad	Walayar - Vadakkanchery (Km 182.500 to Km 240.00)	544	Chullimada Hamlet (Pampampallam)	Km 189.400	10.81311	76.798051	25859	10
308	RO Vijaywada	PIU Anantapur	Hyderabad - Bangalore	7	Marur	Km 376.075	14.499817	77.631127	15422	12
309	RO Vijaywada	PIU Anantapur	Karidikonda - Marur	44 and 7	Kasepalli	Km 310.200	15.061783	77.630325	15489	12
310	RO Vijaywada	PIU Anantapur	Hyderabad Bangalore (km 211.000 to km 462.164)	7	Amakathadu	Km 250.700	15.48468	77.897632	18157	12
311	RO Vijaywada	PIU Nandyal	Kadapa - Kurnool(Km 167.750 - km 356.502)	40	Chagalamarri	Km 228.350	14.979577	78.574764	15146	12
312	RO Vijaywada	PIU Nandyal	Kadapa - Kurnool(Km 167.750 - km 356.502)	40	Palempalli	Km 168.300	14.513518	78.79121	18179	11
313	RO Vijaywada	PIU Nellore	Chilkaluripet - Nellore (Km 1182.802 - Km	5	Bollapalli	Km 1200.000	15.886754	80.070843	25787	14

Sr.	Regional office	PIU	Project Stretch	NH	Plaza Name	Plaza Location	Latitude	Longitude	Traffic at toll plaza	No of Plaza Lane
			1366.547)							
314	RO Vijaywada	PIU Nellore	Chilkaluripet - Nellore (Km 1182.802 - Km 1366.547)	16	Sunambatti (Musunur)	Km 1326.000	14.851896	79.987757	38926	14
315	RO Vijaywada	PIU Nellore	Chilkaluripet - Nellore (Km 1182.802 - Km 1366.547)	16	Tangutur	Km 1264.000	15.358166	80.040105	42600	14
316	RO Vijaywada	PIU Nellore	Tada - Nellore	5,16	Budanam	Km 124.500	14.059589	79.894624	22122	8
317	RO Vijaywada	PIU Nellore	Tada - Nellore	5,16	Sullurpet	Km 86.000	13.744936	79.990993	25819	8
318	RO Vijaywada	PIU Nellore	Tada - Nellore	5,16	Venkatachallam (Old Nellore)	Km 155.000	14.312218	79.916296	45991	8
319	RO Vijaywada	PIU Rajamundry	Tuni - Diwancheruvu [Km 272.000 to Km 200.000 (New Chainage From Km 901.753 to 830.525)]	16	Krishnavaram	Km 865.553	17.215448	82.1107	34518	8
320	RO Vijaywada	PIU Rajamundry	Siddhantham - Gundugolanu(Km 950.283 to Km 1022.494)	16	Unguturu	Km 999.600	16.823729	81.430664	21619	6
321	RO Vijaywada	PIU Rajamundry	Diwancheruvu - Siddhantham(Km 901.753 to Km 950.283)	16	Eethakota	Km 946.300	16.715205	81.827876	22611	6
322	RO Vijaywada	PIU Vijaywada	Gundugolanu - Vijayawada	16	Pottipadu	Km 1072.191	16.572341	80.862502	33312	10
323	RO Vijaywada	PIU Vijaywada	Gundugolanu - Vijayawada	16	Kalaparru	Km 1050.794	16.676408	81.022129	43270	10
324	RO Vijaywada	PIU Vijaywada	Nandigama - Vijayawada	65	Keesara	Km 231.900	16.718077	80.324314	19747	8
325	RO Vijaywada	PIU Vishakapatnam	Champavati/ Kopperla - Visakhapatnam [km 49.00 to Km 2.837 (New Chainage From Km 700.544 to Km 654.204)]	16	Nathavalasa/ Vizianagaram	Km 656.704	18.057967	83.521081	24976	10
326	RO Vijaywada	PIU Vishakapatnam	Vishakhapatnam Port Connectivity Project	5	Main Toll (Gosthani Gate) (Sheela Nagar Panchavati)	Km 9.158	17.713856	83.212186	32581	10
327	RO Vijaywada	PIU Vishakapatnam	Srikakulam - Champavati (km 97.00 to Km 49.00(New Chainage From Km 606.204 to Km 654.204))	16	Chilakapalem	Km 616.704	18.273462	83.807965	35575	10
328	RO Vijaywada	PIU Vishakapatnam	Ankapalli - Tuni [Km 358.00 to Km 272.00(New Chainage From Km 830.525 to Km 741.255)]	16	Vempadu	Km 795.498	17.397831	82.67582	38408	10
329	RO Vijaywada	PIU Vishakapatnam	Vishakhapatnam - Ankapalli [Km 2.837 to &Km 395.870 to Km358.00(New Chainage From Km 700.544 to Km 740.255)]	16	Aganampudi	Km 728.055	17.685435	83.149931	47897	10
330	RO Vijaywada	PIU Vishakapatnam	Icchapuram - Puintola (Km 477.054 to Km 419.600)	5	Bellupada	Km 473.632	19.111282	84.699281	12906	8

Sr.	Regional office	PIU	Project Stretch	NH	Plaza Name	Plaza Location	Latitude	Longitude	Traffic at toll plaza	No of Plaza Lane
331	RO Vijaywada	PIU Vishakapatnam	Ichchapuram - Nandigaon (Km 226.15 to Km160.00(New Chainage Km 477.054 to Km 543.204))	16	Laxmipuram	Km 530.404	18.05799	83.52111	13779	8
332	RO Vijaywada	PIU Vishakapatnam	Nandigama - Srikakulam (Km 160.00 to Km 97.00(New Chainage Km 543.204 to Km 606.204))	16	Madapam	Km 589.554	18.377344	84.000528	24396	8
333	RO West UP	PIU Agra	Agra Bypass (Km 0.000 - Km 32.800)	2 and 3	Raibha	Km 10.800	27.177493	77.811532	0	10
334	RO West UP	PIU Agra	Shikohabad - Etawah (Km 250.000 to Km 321.100)	2	Gurau (Semra Atikabad)	Km 285.000	26.996524	78.777334	36366	10
335	RO West UP	PIU Agra	Tundla - Makhanpur (Km 199.660 to Km 250.533)	2	Tundla	Km 224.950	27.218247	78.272821	56589	10
336	RO West UP	PIU Agra	Agra Aligarh Section	93	Madrak	Km 71.820	27.804002	78.087022	20343	8
337	RO West UP	PIU Agra	Agra Aligarh (Km 0.000 to Km 81.400)	93	Baros	Km 14.950	27.346247	78.032201	21764	8
338	RO West UP	PIU Aligarh	Ghaziabad-Aligarh section ch. 23.600 to 149.900	91	Somna	Km 113.30	28.062821	77.946047	27465	12
339	RO West UP	PIU Aligarh	Ghaziabad-Aligarh section ch. 23.600 to 149.900	91	Luharali	Km 47.500	28.497746	77.629298	37840	12
340	RO West UP	PIU Faridabad	Delhi - Agra	2	Srinagar	Km 74.00	28.00548	77.332377	38506	14
341	RO West UP	PIU Jhansi	Poonch - Orai (Km 155.00 to Km 220.00)	25	Ait	Km 187.500	25.879908	79.210298	20234	10
342	RO West UP	PIU Jhansi	Jhansi - Pooch (Km 90.000 to Km 155.000)(Except Km 97.150 to Km 98.000)	25	Semri	Km 140.400	25.447717	78.570562	22203	10
343	RO West UP	PIU Jhansi	Jhansi - Lalitpur (Km 0.000 to km 49.700)	25 and 26	Babina	km 32.100	25.216966	78.464471	10075	8
344	RO West UP	PIU Jhansi	Jhansi - Lalitpur (Km 49.700 to Km 99.005)	26	Vighaket	Km 85.280	24.789564	78.448812	20002	8
345	RO West UP	PIU Meerut	Meerut - Muzaffarnagar	58	Siwaya	Km 75.990	29.095601	77.710995	36703248	12
346	RO West UP	PIU Moradabad	Moradabad - Bareilly Road Section (Km 148 To Km 262)	24	Niyamatpur Ekrotiya	Km 172.698	28.814182	78.902248	34212	14
347	RO West UP	PIU Moradabad	Moradabad - Bareilly Road Section (Km 148 To Km 262)	24	Thiriya Khetal	km 228.885	28.480289	79.283886	24009	12
348	RO West UP	PIU Moradabad	Garhmukteshwar - Moradabad (Km 93.00 to Km 149.250)	24	Joya	Km 121.975	28.836176	78.420749	72058	10
349	RO West UP	PIU Moradabad	Hapur Moradabad	24	Brijghat	Km 80.500	28.767149	78.110043	42238	9

Details of Regional Office Current Locations

Sr. No	Name	Regional Office	Mobile No.	Office No.	RO Address	Email Id	Lat / Long
1	Sh. Y. Rajeev Reddy	Bengaluru (Karnataka)	994550 7700	080-28397156/ 28397171	National Highways Authority of India Regional Office Sy. No. 13, 14th km, Near Deepak Bus Stop, Nagasandra, M.S. Ramaiah Enclave, Bengaluru - Tumkur Road (NH-4), Bengaluru - 560 073	robangalore@nhai.org	13.048425, 77.504058
2	Sh. Rajeev Singh	Mumbai (Maharashtra & Goa)	970237 1097	022-27564100/ 300	National Highways Authority of India Regional Office 4th Floor, MTNL Telephone Exchange Building, Opp; CBD Belapur Railway Station, CBD- Belapur, Navi Mumbai-400614	romumbai@nhai.org, nhairomaharashtra@gmail.com	19.018243, 73.041316
3	Sh. Rajesh Gupta	Chandigarh (HP,Punjab, Haryana)	981040 5504	0172-2583030 0191-2473363	National Highways Authority of India Regional Office Chandigarh Bays No. 35-38, 1st Floor, Sector-4, Panchkula-134112	rochandigarh@nhai.org	30.690248, 76.854457
4	Shri Vijay Srivastava	Hyderabad (A.P./Telangana)	965091 1334	040-23551774	National Highways Authority of India Regional Office D.No.8-2-334/18, Road No.3, Banjara Hills, Hyderabad-500 034.	rohyderabad@nhai.org nhairohyd@gmail.com	17.423978, 78.438350
5	Sh. Rajeev Agarwal	Lucknow (East U.P.)	705291 1111	0522-2391287 / 2391297	National Highways Authority of India Regional Office 3/248, Vishal Khand, Gomti Nagar, Lucknow, Pin - 226010	rolucknow@nhai.org	26.844365, 80.990223
6	Lt Col Chandan vatsa (Retd)	Lucknow (West U.P.)	919958 1959	5224960291	National Highways Authority of India Regional Office CP-12, Viraj Khand (Opp. Singapore Mall), Gomti Nagar, Lucknow-226010 (U.P.)	rowestup@nhai.org rowestup@gmail.com	26.854191, 81.021951
7	Sh. P. C. Arya	Dehradun (Uttarakhand)	999995 3433	0135-2669752	National Highways Authority of India Regional Office 58/37, Balbir Road, Dehradun 248001	routtarakhand@nhai.org	30.307007, 78.054953

Sr. No	Name	Regional Office	Mobile No.	Office No.	RO Address	Email Id	Lat / Long
8	Sh. B. L. Meena	Chennai (Tamil Nadu & Pudhuchery)	805672 9222	044 22252635/ 22251780	National Highways Authority of India Regional Office SRI TOWER, 3rd Floor, D P-34, SP Industrial Estate, Guindy, Chennai 600 032.	rochennai@nhai.org	13.014552, 80.199928
9	Lt. Col. Ashish Dwivedi	Thirivanthapuram (Kerala)	707099 5199	0471- 2460060	National Highways Authority of India Regional Office TC 36/574-1, Krishna Kripa, ERA-42, Palkulangara Junction, Vallakadavu P.O., Thiruvananthapuram-695 008 Kerala	roerala@nhai.org	8.486665, 76.933408
10	Sh. R. K. Bansal	Gandhinagar (Gujarat)	990403 6096	079- 40306838 / 079- 40306839	National Highways Authority of India Regional Office 235 -239, 2nd Floor, Supermall-01, Above -HDFC Finance, Infocity, Gandhinagar -382 007 (Gujarat)	rogujarat@nhai.org	23.196454, 72.632854
11	Sh. Vishal Gupta	Bhopal, (M.P. & Chattisgarh)	774882 2990	0755-2426638	National Highways Authority of India Regional Office E-2/167 Arera Colony, Near Habibganj Railway Station, Bhopal (M.P.) Pin - 462016	robhopal@nhai.org	23.222469, 77.436181
12	Sh. Col. M. K. Jain	Jammu (J&K)	965001 1901	0191-2467505	National Highways Authority of India Regional Office House No. 315, Sec-1, 1st floor, Channi Himmat, Jammu-180015	rojammu@nhai.org, nhairojamuu@gmail.com	32.692534, 74.900664
13	Shri D. Sarangi	Bhubaneswar Odisha	813078 1101	0674-2361470, 0674-2361570, 0674-2361670, 0674-2361770(Fax.)	National Highways Authority of India Regional Office 301-A, 3rd Floor, Pal Heights, Plot No. J/7, Jaydev Bihar, Bhubneswar	roodisha@nhai.org, ronhaiodisha@gmail.com	20.298461, 85.823478
14	Sh. Raj Chakrabarty	Guwahati (All NE States)	943514 3507	0361-2237995 0361-2237629 (Fax)	National Highways Authority of India Regional Office NEDFI House, 4th Floor, G. S. Road, Dispur, Guwahati-781006, Assam	roghy@nhai.org	26.146601, 91.790496
15	Sh. Ashutosh Gautam	Kolkata West Bengal	983002 7739	033-22268134	National Highways Authority of India Regional Office 119, Park Street, White House, Block-A, 2nd Floor, Kolkata - 700 016	rokolkatta@nhai.org	22.547395, 88.360015

Sr. No	Name	Regional Office	Mobile No.	Office No.	RO Address	Email Id	Lat / Long
16	Sh. A. K. Mishra	Patna (Bihar)	991070 9208	0612-2540898, /0612-2540895	National Highways Authority of India Regional Office D-63, First Floor, Rajesh Kumar Path, Sri Krishnapuri, Boring Road, Patna-800001	ropatna@nhai.org	25.613893, 85.112826
17	Sh. M. K. Jain	Jaipur (Rajasthan)	707371 8555	0141-2292056, 0141-2292054	National Highways Authority of India Regional Office B1, Nityanand Nagar, Queens Road, Vaishali Nagar, Jaipur-302021	rojaipur@nhai.org	26.904775, 75.748865
18	Sh. R. P. Singh	Ranchi (Jharkhand)	076310 20127	0651-2244029/30	National Highways Authority of India Regional Office B-402, Road No.4-C, Ashok Nagar, Ranchi-834002	ranchi@nhai.org	23.349200, 85.298660
19	Sh. M. Chandrasekhar	RO-Nagpur (Chhattisgarh)	909606 7685	0712-2244492/93	National Highways Authority of India Regional Office Plot No.159, Bungalow No.1, Shubhankar Apartments, Ram Nagar, Ambazari Hill Top, Nagpur-440033, Maharashtra,	ronagpur@nhai.org	21.137377, 79.049967
20	Col. R. S. Puri (Retd.)	RO-Shimla (Himachal Pradesh)	989795 6767	1772629419	National Highways Authority of India Regional Office House No-20 A Jakhoo Housing Board Colony, Near Ram Chandra Chowk, Shimla (H.P-171002)	ronhaihp@gmail.com	31.094295, 77.178271
21	Sh. Mohan Nadge	RO-Raipur (Chhattisgarh)	747113 0365	0771-2284365	National Highways Authority of India Regional Office A-7, VIP Estate, Shankar Nagar, Raipur-492007	roraipur@nhai.org	21.257701, 81.672822
22	Sh. Anil Dixit	RO-Vijayawada	738108 3000	0866-2483910 0866-2474496	National Highways Authority of India Regional Office Plot No.21, Teachers Colony, Gurunank Nagar Road, Vijayawada, A.P., 520008	rovijayawada@nhai.org	16.503723, 80.664653

Appendix D to ToR

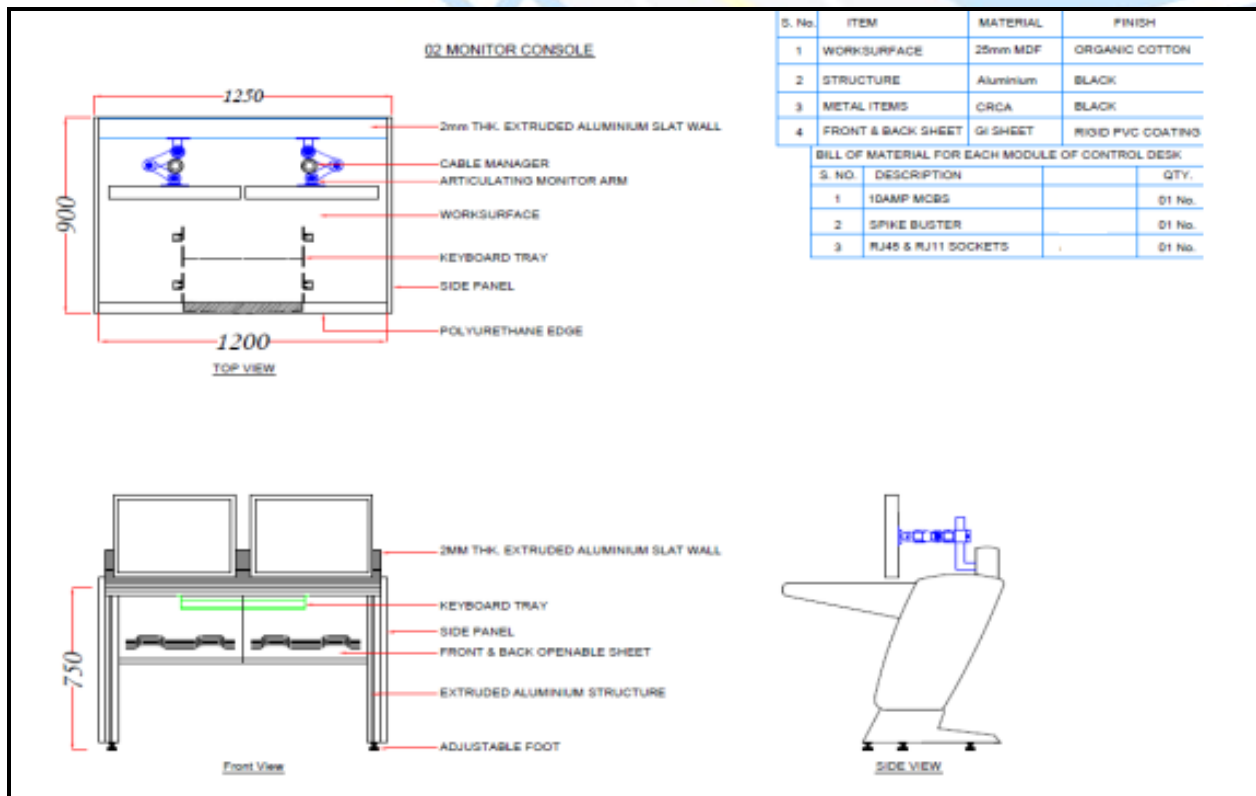
Control Centre Design Layout & Specification of Control Desk at Toll Plaza

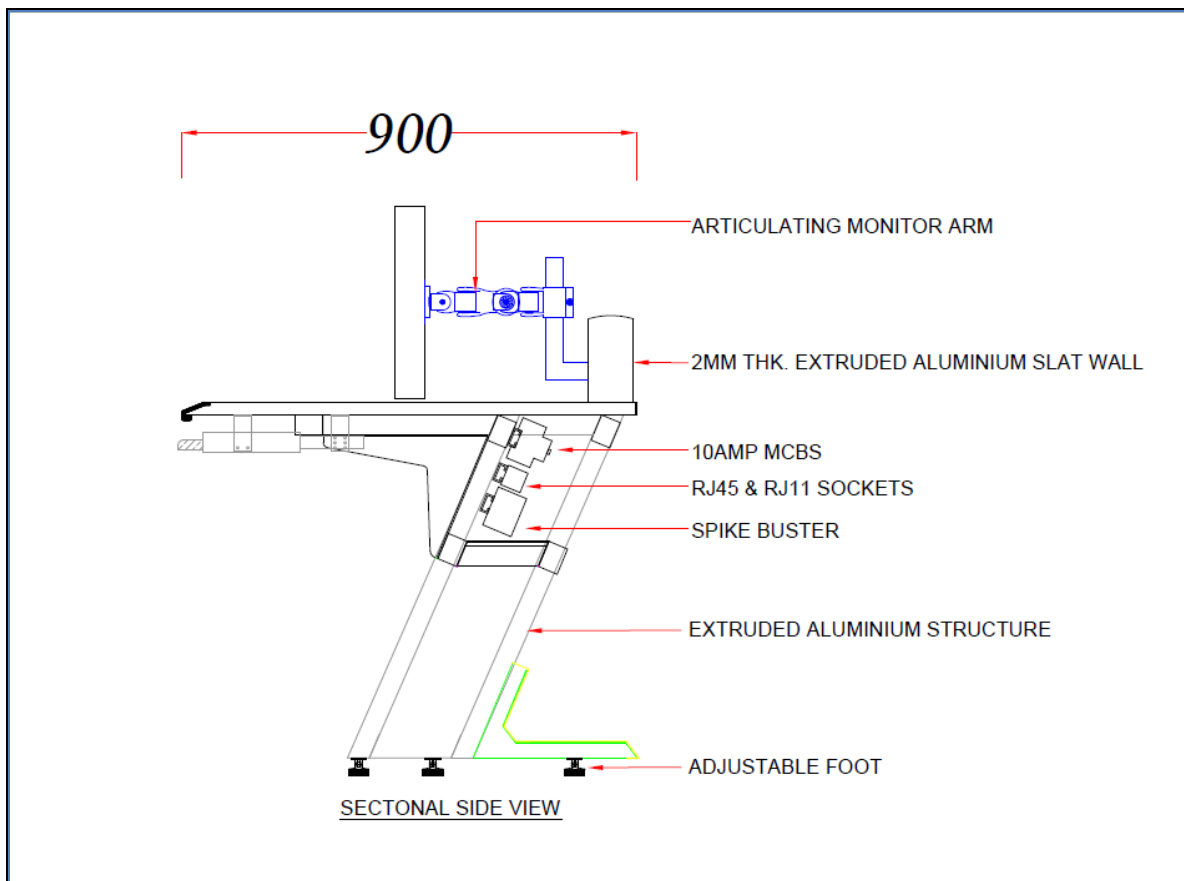


Front View

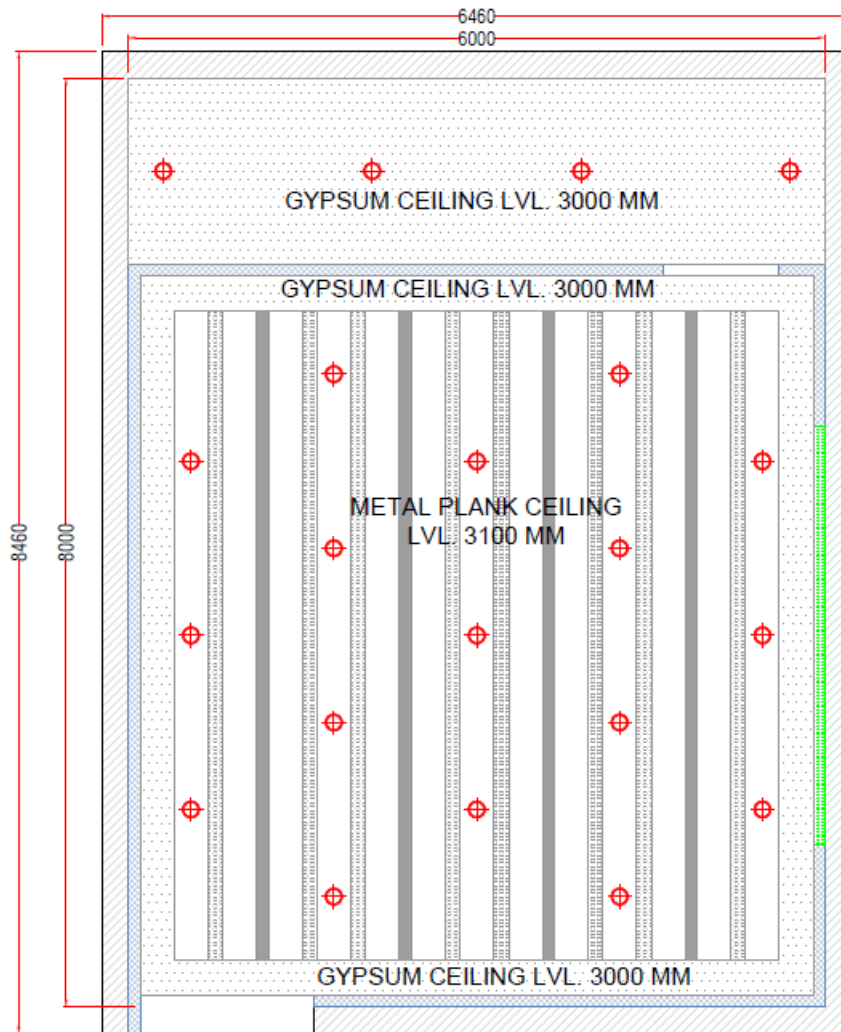


Back View









CEILING LAYOUT



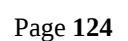


Indicative BOQ for RO Control Room Furniture and Interiors

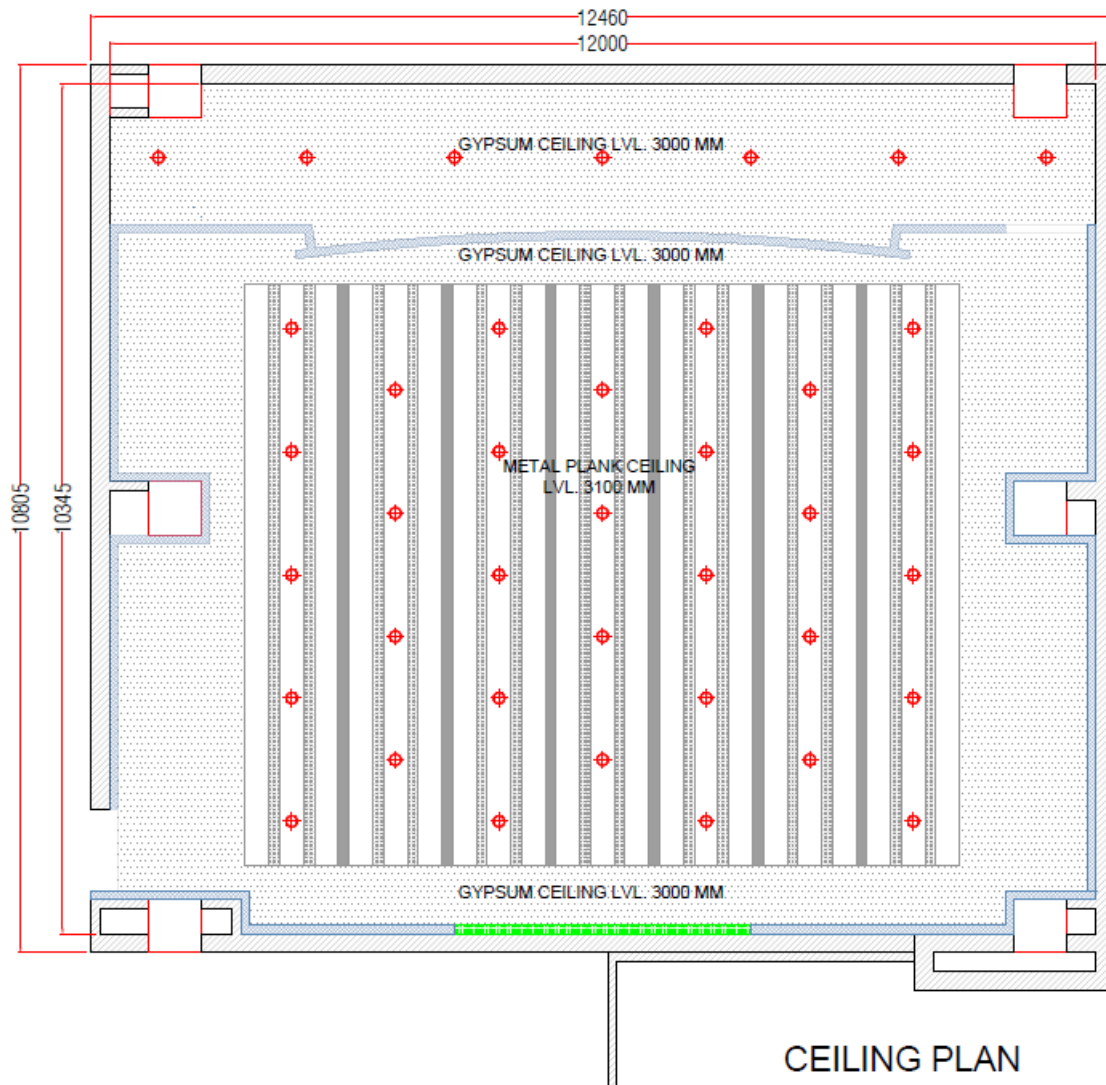
S.No.	Unit	Description	Qty.
		Control Room Furniture	
1	Set	Modular Control Desk for 06 monitors & 03 operators as per the enclosed specifications and 3d image. 1. Desktop made of 25mm MDF with Scratch resistant laminate (NEMA LD3 certified) finish. Table top must be ASTM E84 tested and certified. 2. Front Edge Treatment : Molded PU Nosing over profiled wooden core. 50-60 mm slant ergonomic edge. 3. Side Panel : 25mm laminated panel. 4. Structure: Powder Coated Aluminium Sturdy Structure and extreme side Aesthetic Legs. 5. Rear Wall : Single piece Extruded aluminum wall 6063T6 grade with linear slots running across the length. Slat wall to be minimum 60/70mm wide. 6. Control desk to have seismically qualified design; for Zone 4 (or better). 7. Shutters: ASTM E-84 certified shutter tile with rigid polyvinylchloride (PVC) film and on the other side a coating based on cross linkable polyester resins. 8. Monitor Arm: Slat wall mounted Aluminum Die Casted Fixed Monitor Arms. 9. Ergonomic Compliance: Latest ISO Ergonomic Norms. Approximate Dimensions :- 1200mm (W) X 800mm (D) X 750mm(H).	1
2	Nos	Conference Table: (5 Seater) 1. Table Top: made up of 25mm thick MDF Board with scratch resistant NEMA LD3 certified Laminate. 2. Leg: Ergonomically designed and matching with the open office concept. The leg is made out of specially designed aluminum extruded section with approved finish. The Extrusions shall be duly powder coated with 40+ micron over all surfaces. The top part of leg is having die casted specially designed aluminum connector to connect with structure. 3. Beam: Beam is made of heavy duty Extruded Horizontal Aluminum. The Extrusions is duly powder coated with 40+ micron over all surfaces. The connector is aluminum die casted specially designed to connect with structure. 4. Connector: Pipe and structure are interconnected with Aluminum Die Casted 5. Cable Riser & Cable Tray: made up of MS Powder Coated Finish. 6. Accessories: Flap Approx. Dimensions: 3500(W) X 1200(D) X 750(H) 7. One Monitor Screens with Roll in & Roll out Mechanism	1
3	Nos	19" Rack Systems- 42 U Extra deep 19" enclosure accommodates all full size rack mount equipment. Dimension: 600 mm x 800 mm x 42U (D X W X (2000) H) Material: Cold rolled Closed Annealed (CRCA) Sheet. Front Door: 6 mm thick toughened glass door with handle lock. Rear Door: 1.6 mm thick Perforated Rear door with advanced handle Lock facilities. Side Panels: 2 mm thick Perforated Steel side panels. Bottom Plate: 2 mm thick Heavy duty bottom plates. PVC Cable manger: Convenient 2Nos PVC vertical cable managers Cooling Fan: Pre-installed 4 Nos FAN . Surge Box: Preinstalled 1 Nos surge box (4 sockets with 1 main Switch facility) 220V Ac 50Hz rating.	1
4	Nos	Printer Table for A4 size printer:- 1. Table top made of 25mm MDF. 2. Extruded aluminum profile with 2 mm thk. Vertical support. 3. Proper Cable tray for flow of wire.	
	Nos	Chair: 1. High Back Chair 2. PP Arm 3. Nylon Base 4. Gas Lift 5. Seat Back Net Tapestry	8
		Control Room Interior	
5	Sq.ft	Lattice Multi Layered Metal Concept Paneling :- It shall consist of CNC Laser cut & Powder coat metal panel with metal sheets of Preformed textured RIGID PVC over GI sheet panels which shall be fixed on framework.	128
6	Sq.ft	Acoustic Metal Paneling:- Paneling with factory made removable type self inter lockable metal panels of Preformed textured RIGID PVC coated GI sheet panels. The metal panels will be fixed on structure made of 1.6 mm thick MS channels bended over automatic punching and bending CNC. and their properties shall be as follows :-1) Resistance to extremes of weather exposure and temperature. 2) Very low coefficient of expansion. 3) Can be cleaned using detergents. 4) Superior flatness – ideal of creating smooth, monolithic surface.	876
7	Nos	12mm thick frameless tempered clear glass Double door WITH 100mm Metal frame; similar to that of partition):- Size :- 1500mm X 2400mm a. 12mm thick tempered clear glass door with door spring and locking arrangements and both way handle and patch fittings. b. Glass Properties: Safety (tempered): when broken, must split into tiny harmless pieces.	1

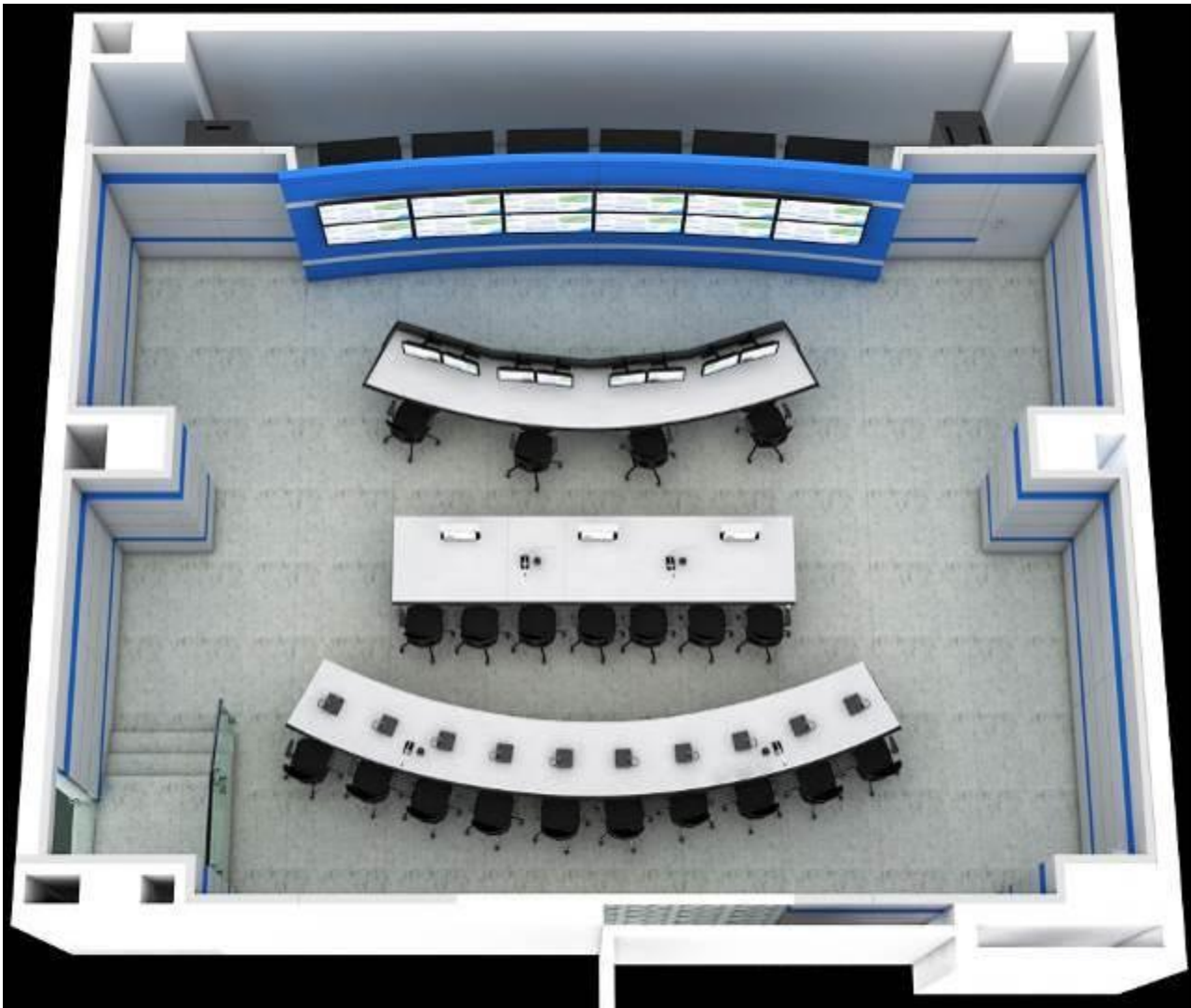
8	Sq.ft	Designer Acoustic Metal False ceiling with linear planks:- The ceiling system will consist of linear box shaped panels shall be made up of combination of perforated and non-perforated panels so as to achieve strength and acoustics. These tiles shall be bend through CNC, machine punched & laser Cut so as to achieve perfect accuracy. Panels fixed to an adjustable suspension system which allows for individual panels to be removable type. Structure shall be made from heavy duty powder coated modular steel frame (minimum sheet thickness 1 to 1.6mm). Anchor fastener and GI self-threaded rods for grout this from roof. It shall be formed with the help of slotted rolled W sections (stiffener) and M section (Master) with help of M6 cage nut and bolts.	381
9	Sq.ft	Calcium Silicate Board Ceiling Material:- Plain Calcium Silicate acoustic Boards for false ceiling with 12mm Approx. thick, Structure for underside of suspended grid formed of GI perimeter channels. Wood screws and metal expansion raw plugs for fixing with wall. Plastic emulsion paint of approved make and shade for finishing surface of Calcium Silicate Boards. Specification: Calcium Silicate Board is manufactured from a mixture of Portland cement, fine silica, special cellulose fibers and selected fillers to impart durability, toughness, fire and moisture resistance. Expansion after expose to the water for 24 Hr.: 0.12%, Noise Resistance: B38, Water absorption by Weight: 34%, Fire resistance: BS 476 incombustible A1 Class.	152
10	Nos	Round LED Ceiling light: High performance LED downlighter with high system efficacy for good quality and uniform lighting. Conforms to general lighting norms for office and other indoor applications. Features • Consistent light output • Long life • CRI >80 Specifications : DLED Mini LED engine, 1000lm package, CFL replacement up to 2x18W, CCT Warm white: 3000K / Neutral white: 4000K / Cool white: 5000K, 12W Power (4000K), System efficacy : 75lm/W (3000K) / 78lm/W (4000K, 5000K), 220V-240V/50, 60Hz Voltage, Integrated driver, High quality diffuser Optics, ø152mm Cut out, Material : Heat sink: die-cast Diffuser: PMMA Reflector: PC Clip: steel, White (RAL9010) Ring color, Spring clip, 5 SDCM.	18
11	Nos	Round LED Emergency Light: Emergency lighting provided for use when the supply to the normal lighting fails; emergency lighting shall be activated not only on complete failure of the supply to the premises but also on a localized circuit failure. Features • Consistent light output • Long life • CRI >80 Specifications : DLED Mini LED engine, 1000lm package, CFL replacement up to 2x18W, CCT Warm white: 3000K / Neutral white: 4000K / Cool white: 5000K, 12W Power (4000K), System efficacy : 75lm/W (3000K) / 78lm/W (4000K, 5000K), 220V-240V/50, 60Hz Voltage, Integrated driver, High quality diffuser Optics, ø152mm Cut out, Material : Heat sink: die-cast Diffuser: PMMA Reflector: PC Clip: steel, White (RAL9010) Ring color, Spring clip, 5 SDCM.	6
12	Nos	Dynamic Controller	1
13	R.ft	Cove Light for designer Ceiling: It will be a continuous rail of LED light, high brightness, neutral, or warm white with wall washing applications. Its slim profile and simple daisy-chain system allows high design flexibility to form long.	88
6	Nos	Wires, Switches & Conduits for ceiling lights: Wires for ceiling lights inter looping and switches will be provided, consisting of PVC insulated copper conductor stranded flexible FRLS wires of 1100 volts grade of insulation, in metallic conduits, PVC/ metallic conduits. Minimum size of copper conductor shall be 1.5 sq. mm for lighting and 2.5 sqmm for power. color of wires shall be Red/Yellow/Blue (or as per Local Standards) for the all single phases, Black for neutral and Green for earthing.	534
7	Sqft	Flooring material of Acoustic Flooring Systems: Floor system with twin layer linoleum built up from 2 mm Acoustic Laminate and a 2 mm Corkment backing. All tiles to be decorative type of approved shade, pattern, texture and design and of approved manufacturer. Dimensions shall be as per the final approved design and site requirement.	534
8	Sqft	**M. S. Structure for suspending false ceiling :- (Optional can be taken in customer scope) Fabricated MS Structure required for false ceiling	534

This architectural floor plan illustrates a lecture hall with a semi-circular seating arrangement. The overall dimensions are 12460 units in width and 10345 units in depth. The seating is organized into two main curved sections, each with 12 rows. The front section has 12 seats per row, while the rear section has 10 seats per row. A central aisle, 4900 units wide, separates the two seating areas. A stage area, 1000 units wide, is located at the front of the hall. The plan includes numerous dimensions for individual seats, aisles, and structural elements, as well as labels for doors (DN) and a staircase (UP).



Ceiling Plan of CCC







Indicative BOQ with Technical Specifications for NHAI HQ Control Room Furniture and Interiors

S.No.	Unit	Description	Qty.
		Control Room Furniture	
1	Set	New Modular Control Desk for 08 monitors & 04 operators as per the enclosed specifications and 3d image. 1. Desktop made of 25mm MDF with Scratch resistant laminate (NEMA LD3 certified) finish. Table top must be ASTM E84 tested and certified. 2. Front Edge Treatment : Molded PU Nosing over profiled wooden core. 50-60 mm slant ergonomic edge. 3. Side Panel : 25mm laminated panel. 4. Structure: Powder Coated Aluminium Sturdy Structure and extreme side Aesthetic Legs. 5. Rear Wall : Single piece Extruded aluminum wall 6063T6 grade with linear slots running across the length. Slat wall to be minimum 60/70mm wide. 6. Control desk to have seismically qualified design; for Zone 4 (or better). 7. Shutters: ASTM E-84 certified shutter tile with rigid polyvinylchloride (PVC) film and on the other side a coating based on cross linkable polyester resins. 8. Monitor Arm : Slat wall mounted Aluminum Die Casted Fixed Monitor Arms. 9. Ergonomic Compliance : Latest ISO Ergonomic Norms. Approximate Dimensions :- 1200mm (W) X 800mm (D) X 750mm(H).	1
2	Nos	Conference Table: (7 Seater) Conference Table: 1. Table Top: made up of 25mm thick MDF Board with scratch resistant NEMA LD3 certified Laminate. 2. Leg: Ergonomically designed and matching with the open office concept. The leg is made out of specially designed aluminum extruded section with approved finish. The Extrusions shall be duly powder coated with 40+ micron over all surfaces. The top part of leg is having die casted specially designed aluminum connector to connect with structure. 3. Beam: Beam is made of heavy duty Extruded Horizontal Aluminum. The Extrusions is duly powder coated with 40+ micron over all surfaces. The connector is aluminum die casted specially designed to connect with structure. 4. Connector: Pipe and structure are interconnected with Aluminum Die Casted 5. Cable Riser & Cable Tray: made up of MS Powder Coated Finish. 6. Accessories: Flap Approx. Dimensions: 4900(W) X 1200(D) X 750(H) 7. Three Monitor Screens with Roll in & Roll out Mechanism	1

S.No.	Unit	Description	Qty.
3	Set	New Modular Control Desk for provision of 10 Nos PA System as per the enclosed specifications and 3d image. 1. Desktop made of 25mm MDF with Scratch resistant laminate (NEMA LD3 certified) finish. Table top must be ASTM E84 tested and certified. 2. Front Edge Treatment : Molded PU Nosing over profiled wooden core. 50-60 mm slant ergonomic edge. 3. Side Panel : 25mm laminated panel. 4. Structure: Powder Coated Aluminium Sturdy Structure and extreme side Aesthetic Legs. 5. Ergonomic Compliance : Latest ISO Ergonomic Norms. Approximate Dimensions :- 1500mm (W) X 700mm (D) X 750mm(H).	1
4	Set	New Modular Control Desk for provision of 08 Nos PA System as per the enclosed specifications and 3d image. 1. Desktop made of 25mm MDF with Scratch resistant laminate (NEMA LD3 certified) finish. Table top must be ASTM E84 tested and certified. 2. Front Edge Treatment : Molded PU Nosing over profiled wooden core. 50-60 mm slant ergonomic edge. 3. Side Panel : 25mm laminated panel. 4. Structure: Powder Coated Aluminium Sturdy Structure and extreme side Aesthetic Legs. 5. Ergonomic Compliance : Latest ISO Ergonomic Norms. Approximate Dimensions :- 1500mm (W) X 700mm (D) X 750mm(H).	1
5	Nos	Chair: 1. High Back Chair 2. PP Arm 3. Nylon Base 4. Gas Lift 5. Seat Back Net Tapestry	45
6	Nos.	Printer Table for A3 size printer:- 1. Table top made of 25mm MDF.2. Extruded aluminum profile with 2 mm thk. Vertical support.3. Proper Cable tray for flow of wire.	1
7	Nos	19" Rack Systems- 42 U Extra deep 19" enclosure accommodates all full size rack mount equipment. Dimension: 600 mm x 800 mm x 42U (D X W X (2000) H) Material: Cold rolled Closed Annealed (CRCA) Sheet. Front Door: 6 mm thick toughened glass door with handle lock. Rear Door: 1.6 mm thick Perforated Rear door with advanced handle Lock facilities. Side Panels: 2 mm thick Perforated Steel side panels. Bottom Plate: 2 mm thick Heavy duty bottom plates. PVC Cable manger: Convenient 2Nos PVC vertical cable managers Cooling Fan: Pre-installed 4 Nos FAN . Surge Box: Preinstalled 1 Nos surge box (4 sockets with 1 main Switch facility) 220V Ac 50Hz rating.	2
		Control Room Interior	
8	Sq.ft	Lattice Multi Layered Metal Concept Paneling :- It shall consist of CNC Laser cut & Powder coat metal panel with metal sheets of Preformed textured RIGID PVC over GI sheet panels which shall be fixed on framework.	116
9	Sq.ft	Acoustic Metal Paneling :- Paneling with factory made removable type self inter lockable metal panels of Preformed textured RIGID PVC coated GI sheet panels. The metal panels will be fixed on structure made of 1.6 mm thick MS channels bended over automatic punching and bending CNC. and their properties shall be as follows :- 1) Resistance to extremes of weather exposure and temperature. 2) Very low coefficient of expansion. 3) Can be cleaned using detergents. 4) Superior flatness – ideal of creating smooth, monolithic surface.	1290
10	Nos	12mm thick frameless tempered clear glass Single door WITH 100mm Metal frame; similar to that of partition):- Size :- 1000mm X 2400mm a. 12mm thick tempered clear glass door with door spring and locking arrangements and both way handle and patch fittings. b. Glass Properties: Safety (tempered): when broken, must split into tiny harmless pieces.	1
11	Sq.ft	Designer Acoustic Metal False ceiling with linear planks :- The ceiling system will consist of linear box shaped panels shall be made up of combination of perforated and non-perforated panels so as to achieve strength and acoustics. These tiles shall be bend through CNC, machine punched & laser Cut so as to achieve perfect accuracy. Panels fixed to an adjustable suspension system which allows for individual panels to be removable type. Structure Shall be made from heavy duty powder coated modular steel frame (minimum sheet thickness 1 to 1.6mm). Anchor fastener and GI self-threaded rods for grout this from roof. It shall be formed with the help of slotted rolled W sections (stiffener) and M section (Master) with help of M6 cage nut and bolts.	870

S.No.	Unit	Description	Qty.
12	Sq.ft	Calcium Silicate Board Ceiling Material:- Plain Calcium Silicate acoustic Boards for false ceiling with 12mm Approx. thick, Structure for underside of suspended grid formed of GI perimeter channels. Wood screws and metal expansion raw plugs for fixing with wall. Plastic emulsion paint of approved make and shade for finishing surface of Calcium Silicate Boards.Specification: Calcium Silicate Board is manufactured from a mixture of Portland cement, fine silica, special cellulose fibers and selected fillers to impart durability, toughness, fire and moisture resistance.Expansion after expose to the water for 24 Hr.: 0.12%, Noise Resistance: B38, Water absorption by Weight: 34%, Fire resistance: BS 476 incombustible A1 Class.	430
13	Nos	Round LED Ceiling light :- High performance LED downlighter with high system efficacy for good quality and uniform lighting. Conforms to general lighting norms for office and other indoor applications. Features • Consistent light output • Long life • CRI >80 Specifications : DLED Mini LED engine, 1000lm package, CFL replacement up to 2x18W, CCT Warm white: 3000K / Neutral white: 4000K / Cool white: 5000K, 12W Power (4000K), System efficacy : 75lm/W (3000K) / 78lm/W (4000K, 5000K), 220V-240V/50, 60Hz Voltage, Integrated driver, High quality diffuser Optics, ø152mm Cut out, Material : Heat sink: die-cast Diffuser: PMMA Reflector: PC Clip: steel, White (RAL9010) Ring color, Spring clip, 5 SDCM.	38
14	Nos	Round LED Emergency Light :- Emergency lighting provided for use when the supply to the normal lighting fails; emergency lighting shall be activated not only on complete failure of the supply to the premises but also on a localized circuit failure. Features • Consistent light output • Long life • CRI >80 Specifications : DLED Mini LED engine, 1000lm package, CFL replacement up to 2x18W, CCT Warm white: 3000K / Neutral white: 4000K / Cool white: 5000K, 12W Power (4000K), System efficacy : 75lm/W (3000K) / 78lm/W (4000K, 5000K), 220V-240V/50, 60Hz Voltage, Integrated driver, High quality diffuser Optics, ø152mm Cut out, Material : Heat sink: die-cast Diffuser: PMMA Reflector: PC Clip: steel, White (RAL9010) Ring color, Spring clip, 5 SDCM.	10
15	Nos	Dynamic Controller	2
16	R.ft	Cove Light for designer Ceiling :- It will be a continuous rail of LED light, high brightness , neutral, or warm white with wall washing applications. Its slim profile and simple daisy-chain system allows high design flexibility to form long.	234
17	Nos	Wires, Switches & Conduits for ceiling lights :- Wires for ceiling lights inter looping and switches will be provided, consisting of PVC insulated copper conductor stranded flexible FRLS wires of 1100 volts grade of insulation, in metallic conduits, PVC/ metallic conduits. Minimum size of copper conductor shall be 1.5 sq. mm for lighting and 2.5 sqmm for power. color of wires shall be Red/Yellow/Blue (or as per Local Standards) for the all single phases, Black for neutral and Green for earthing.	1300
18	Sqft	Flooring material of Acoustic Flooring Systems :- Floor system with twinlayer linoleum built up from 2 mm Acoustic Laminate and a 2 mm Corkment backing. All tiles to be decorative type of approved shade, pattern, texture and design and of approved manufacturer. Dimensions shall be as per the final approved design and site requirement.	1266



PART-III

FORMAT FOR BID SUBMISSION

Form T-1: Technical Bid Covering Letter

(To be prepared on letterhead of the Bidder, scanned & uploaded on E-tender portal)

To,
General Manager (Electronics)
National Highways Authority of India
G 5&6, Sector-10, Dwarka,
New Delhi - 110075

Sub.: RFP for Command and Control Centre including Video Conference, CCTV Surveillance & Monitoring of Vehicular Congestion on National Highway Toll Plazas

Ref: RFP No. NHAI/13051/01/2017-IT (Revised) dated 21/06/2017 on above subject.

Dear Sir,

1. I/We, the undersigned, have carefully examined the contents of the above referred RFP document including amendments/ addendums (if any) thereof and we undertake to fully comply and abide by the terms and conditions specified therein and hereby submit our Bid for the aforesaid service. Our bid for the subject RFP is unconditional and unqualified.
2. I/We offer to execute the work in accordance with the Scope of work and the Conditions of Contract of this RFP both explicit and implied.
3. I/We undertake that, in competing for (and, if the award is made to us), for executing the above contract, we will strictly observe the laws against fraud and corruption in force in India namely "Prevention of Corruption Act 1988".
4. I/We understand that :
 - (a) This bid, if found incomplete in any respect and/ or if found with conditional compliance or not accompanied with the requisite Bid Security, shall be summarily rejected.
 - (b) If at any time, any averments made or information furnished as part of this bid is found incorrect, then the bid will be rejected and the contract if awarded on the basis of such information shall be cancelled.
 - (c) NHAI is not bound to accept any/ all Bid(s) it will receive.
 - (d) Until a contract is executed, this bid together with RFP Document as well as notification of Letter of Award issued by NHAI shall constitute a binding Contract between us.
5. I/We declare that :
 - (a) I/We have not been blacklisted/ *declared ineligible* by NHAI or Ministry of Road Transport & Highways, Government of India or any other agency. I/We also confirm that I/We have not been *declared as non-performing or debarred* by NHAI or Ministry of Road Transport & Highways, Government of India.
 - (b) I/We *haven't been blacklisted* by a Central/ State Government Institution/ Public Sector Undertaking/ Autonomous body and there has been *no litigation* with any Government Department/ PSU/ Autonomous body on account of similar services.
 - (c) I/We have *not* directly or indirectly or through an agent *engaged or indulged in any corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice*, as defined in the Contract Agreement, in respect of any tender or request for proposal issued by or any Contract entered into with NHAI or any other public sector enterprise or any government, Central or State; and I/We hereby certify that we have taken steps to ensure that in conformity with the provisions of the RFP document, no person acting for us or on our behalf has engaged or will engage in any

corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice.

6. In the event of my / our bid being declared as successful bid, I/we agree to enter into a Contract Agreement in accordance with the format of the Contract Agreement. I/We agree not to seek any change in the aforesaid format of the Contract Agreement and agree to abide by the same.

7. I/We certify that :

- (i) I/We have not been convicted by a Court of Law or indicted or adverse orders passed by a regulatory authority which could cast a doubt on our ability to undertake the subject work or which relates to a grave offence that outrages the moral sense of the community.
- (ii) Neither the bidder nor any of its Directors are the subject of criminal or civil proceedings that could be expected to adversely affect its business or its ability to bid in the present tender.
- (iii) No investigation by a regulatory authority is pending either against us or against our CEO or any of our directors/ managers/ employees.
- (iv) I / We don't have any conflict of interest in terms of Clause 2.2 of eligibility criteria defined in this RFP document.**
- (v) The information provided in this technical bid (including the attachments) as well as the financial bid is true, accurate and complete to the best of my knowledge and belief. Nothing has been omitted which renders such information misleading; and all documents accompanying my/our bid are true copies of their respective originals. I/We shall be liable for disqualification or termination of contract at any stage, if any information/ declaration is found to be incorrect or false. I/We will intimate NHAI promptly in case of any change in the information submitted as part of this technical bid.
- (vi) I/We offer the cost of the RFP document and bid security in accordance with the RFP document as per the details furnished below:

	DD/ Bankers Cheque No.	Date	Amount (Rs.)	Issuing Bank/ Branch
1. Tender Fee				
2. Bid Security				

- (vii) The documents in original accompanying the bid document have been submitted in a separate envelope as envisaged in the RFP document and marked appropriately.
- (viii) I am the Director / Authorized Signatory of the aforesaid company / firm and I am authorized to sign this bid on behalf of the firm / company. I am submitting this bid after carefully reading all the terms and conditions contained in the RFP document and its addendum/ amendment, if any, and undertake to abide by the same. It is also certified that the bid is being submitted in the prescribed formats without any addition / deviation / alteration and our bid is unconditional.

We remain,

Yours sincerely,

Name

Designation/ Title of the Authorized Signatory.....

Form T-2: Brief Information about the Bidder(s)

(To be prepared on letterhead of the Bidder, scanned & uploaded on E-tender portal)

Sub.: RFP for Command and Control Centre including Video Conference, CCTV Surveillance & Monitoring of Vehicular Congestion on National Highway Toll Plazas

Ref: RFP No. NHAI/13051/01/2017-IT (Revised) dated 21/06/2017 on above subject.

1. (a) Name of Bidder:

(b) Year of establishment

(c) Constitution of the bidder entity e.g. Government enterprise, private limited company, limited company, proprietorship / partnership firm etc.

(d) In case of a Government enterprise, please indicate as to whether legally and financially autonomous and operate under commercial law.

Yes/ No/ Not applicable

(e) Name(s) of Directors/ Proprietors/ Partners

.....
.....
.....

2. Address for correspondence with Telephone/ Fax numbers/ e-mail address:

(a) Complete postal address:

(b) Fixed telephone number

(c) Mobile telephone number

(d) E-mail address

3. Name & Address of the principal banker¹¹:

(a) Bank A/c Number

(b) Branch Address

(c) IFSC /MICR Code:

4. Name of the Statutory Auditor/ Company Secretary/ Chartered Accountant certifying the documents along with his/ her Membership number, if applicable:

Name

Designation/ Title of the Authorized Signatory.....

Note: In case of JV/ Consortium, the aforesaid information shall be required for each member of the JV/ Consortium separately.

¹¹ These details are required for refund of Bid Security.

Form T-3: Power of Attorney

Know all men by these presents, we, (name of Company and address of the registered office) do hereby constitute, nominate, appoint and authorize Mr / Ms..... son/daughter/wife of..... and presently residing at, who is presently employed with us and holding the position of as our true and lawful attorney (hereinafter referred to as the "Authorized Signatory or Attorney") to do in our name and on our behalf, all such acts, deeds and things as are necessary or required in connection with or incidental to submission of our Bid for selection as the Service Provider for "Design, Supply Installation, Testing, Commissioning, Configuration, System Integration, Operations and Maintenance of Comprehensive System for Command and Control Centre including Video Conference, CCTV Surveillance & Monitoring of Vehicular Congestion on National Highway Toll Plazas" proposed by National Highways Authority of India, including but not limited to signing and submission of all applications, bid(s) and other documents and writings, and providing information/ responses to NHAI, representing us in all matters before NHAI, signing and execution of all contracts and undertakings consequent to acceptance of our bid and generally dealing with NHAI in all matters in connection with or relating to or arising out of our Bid for the said Tender and/or upon award thereof to us.

AND, we do hereby agree to ratify and confirm all acts, deeds and things lawfully done or caused to be done by our said Authorised Signatory or Attorney pursuant to and in exercise of the powers conferred by this Power of Attorney and that all acts, deeds and things done by our said Authorised Representative/ Attorney in exercise of the powers hereby conferred shall and shall always be deemed to have been done by us.

IN WITNESS WHEREOF WE,THE ABOVE NAMED PRINCIPAL HAVE EXECUTED THIS POWER OF ATTORNEY ON THIS DAY OF, 2017

For
(Signature, name, designation and address)

Witnesses:

1.

2.

Notarised

Accepted

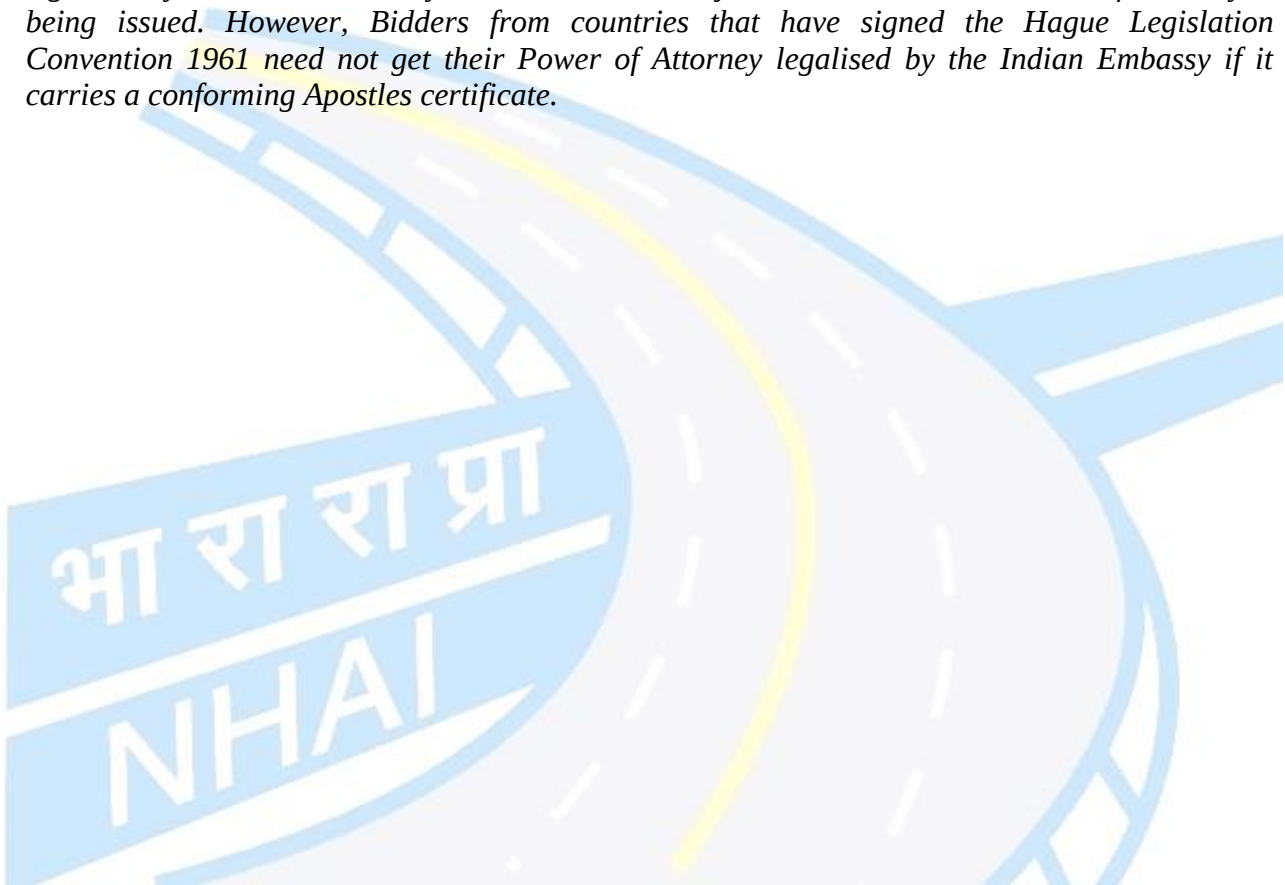
.....
(Signature, name, designation and address of the Attorney)

Notes:

*The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executants(s) and when it is so required the same should be under common seal affixed in accordance with the required procedure. **The Power of Attorney should be executed on a non-judicial stamp paper of appropriate denomination and should be duly notarised by a notary public.***

Wherever required, the Bidder should submit for verification the extract of the charter documents and other documents such as a resolution/power of attorney in favour of the person executing this Power of Attorney for the delegation of power hereunder on behalf of the Bidder.

For a Power of Attorney executed and issued overseas, the document will also have to be legalised by the Indian Embassy and notarised in the jurisdiction where the Power of Attorney is being issued. However, Bidders from countries that have signed the Hague Legislation Convention 1961 need not get their Power of Attorney legalised by the Indian Embassy if it carries a conforming Apostles certificate.



Form T-4: Power of Attorney for Lead Member of JV/ Consortium

Whereas the National Highways Authority of India (“Authority”) has invited bids from interested parties for the *selection as the Service Provider for “Design, Supply Installation, Testing, Commissioning, Configuration, System Integration, Operations and Maintenance of Comprehensive System for Command and Control Centre including Video Conference, CCTV Surveillance & Monitoring of Vehicular Congestion on National Highway Toll Plazas”* (“the Project”).

Whereas,, and (collectively the “JV/ Consortium”) being Members of the JV/ Consortium are interested in bidding for the Project in accordance with the terms and conditions of the Request for Proposal and other connected documents in respect of the Project, and

Whereas, it is necessary for the Members of the JV/ Consortium to designate one of them as the Lead Member with all necessary power and authority to do for and on behalf of the JV/ Consortium, all acts, deeds and things as may be necessary in connection with the JV/ Consortium’s bid for the Project and its execution.

NOW THEREFORE KNOW ALL MEN BY THESE PRESENTS

We, M/s. having our registered office at, M/s., having our registered office at, and M/s., having our registered office at, (hereinafter collectively referred to as the “Principals”) do hereby irrevocably designate, nominate, constitute, appoint and authorise M/s., having its registered office at, being one of the Members of the JV/ Consortium, as the Lead Member and true and lawful attorney of the JV/ Consortium (hereinafter referred to as the “Attorney”) and hereby irrevocably authorise the Attorney (with power to sub-delegate) to conduct all business for and on behalf of the JV/ Consortium and any one of us during the bidding process and, in the event the JV/ Consortium is awarded the Contract, during the execution of the Project, and in this regard, to do on our behalf and on behalf of the JV/Consortium, all or any of such acts, deeds or things as are necessary or required or incidental to the submission of its bid for the Project, including but not limited to signing and submission of all applications, bids and other documents and writings, accept the Letter of Award, participate in bidders’ and other conferences, respond to queries, submit information/ documents, sign and execute contracts and undertakings consequent to acceptance of the bid of the JV/Consortium and generally to represent the JV/Consortium in all its dealings with the Authority, and/ or any other Government Agency or any person, in all matters in connection with or relating to or arising out of the JV’s/ Consortium’s bid for the Project and/ or upon award thereof till the Contract is entered into with the Authority and Completed.

AND hereby agree to ratify and confirm and do hereby ratify and confirm all acts, deeds and things done or caused to be done by our said Attorney pursuant to and in exercise of the powers conferred by this Power of Attorney and that all acts, deeds and things done by our

said Attorney in exercise of the powers hereby conferred shall and shall always be deemed to have been done by us/ JV/Consortium.

IN WITNESS WHEREOF WE THE PRINCIPALS ABOVE NAMED HAVE EXECUTED THIS POWER OF ATTORNEY ON THIS DAY OF 20.....

For

(Signature, Name & Title)

For

(Signature, Name & Title)

For

(Signature, Name & Title)

Witnesses:

1.

2.

(Executants)

(To be executed by all the Members of the Consortium)

Notes:

- *The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and when it is so required, the same should be under common seal affixed in accordance with the required procedure. **The Power of Attorney should be executed on a non-judicial stamp paper of appropriate denomination and should be duly notarised by a notary public.***
- *Wherever required, the Bidder should submit for verification the extract of the charter documents and documents such as a resolution/ power of attorney in favour of the person executing this Power of Attorney for the delegation of power hereunder on behalf of the Bidder.*
- *For a Power of Attorney executed and issued overseas, the document will also have to be legalised by the Indian Embassy and notarised in the jurisdiction where the Power of Attorney is being issued. However, the Power of Attorney provided by Bidders from countries that have signed the Hague Legislation Convention, 1961 are not required to be legalised by the Indian Embassy if it carries a conforming Apostille certificate.*

Form T-5: Joint Bidding Agreement for JV/ Consortium

(To be executed on Stamp paper of appropriate value)

THIS JOINT BIDDING AGREEMENT is entered into on this the day of 20...

AMONGST

1. {..... Limited, and having its registered office at } (hereinafter referred to as the **“First Part”** which expression shall, unless repugnant to the context include its successors and permitted assigns)

AND

2. {..... Limited, having its registered office at } and (hereinafter referred to as the **“Second Part”** which expression shall, unless repugnant to the context include its successors and permitted assigns)

AND

3. {..... Limited, and having its registered office at } (hereinafter referred to as the **“Third Part”** which expression shall, unless repugnant to the context include its successors and permitted assigns)

The above mentioned parties of the FIRST, {SECOND and THIRD} PART are collectively referred to as the **“Parties”** and each is individually referred to as a **“Party”**

WHEREAS,

- (A) THE NATIONAL HIGHWAYS AUTHORITY OF INDIA, established under the National Highways Authority of India Act 1988, represented by its Chairman and having its principal offices at G-5 & 6, Sector 10, Dwarka, New Delhi-110075 (hereinafter referred to as the **“Authority”** which expression shall, unless repugnant to the context or meaning thereof, include its administrators, successors and assigns) has invited bids (the **Bids**) by its Request for Proposal No NHAI/13051/01/2017-IT (Revised) dated 21/06/2017 (the **“RFP”**) for award of contract for *“Design, Supply Installation, Testing, Commissioning, Configuration, System Integration, Operations and Maintenance of Comprehensive System for Command and Control Centre including Video Conference, CCTV Surveillance & Monitoring of Vehicular Congestion on National Highway Toll Plazas”* (the **“Project”**).
- (B) The Parties are interested in jointly bidding for the Project as members of a JV/ Consortium and in accordance with the terms and conditions of the RFP document and other bid documents in respect of the Project, and
- (C) It is a necessary condition under the RFP document that the members of the JV/ Consortium shall enter into a Joint Bidding Agreement and furnish a copy thereof with the Bid.

NOW IT IS HEREBY AGREED as follows

1. Definitions and Interpretations

In this Agreement, the capitalized terms shall, unless the context otherwise requires, have the meaning ascribed thereto under the RFP.

2. Consortium

2.1 The Parties do hereby irrevocably constitute a JV/ consortium (the “**JV/ Consortium**”) for the purposes of jointly participating in the Bidding Process for the Project.

2.2 The Parties hereby undertake to participate in the Bidding Process only through this JV/ Consortium and not individually and/ or through any other JV/Consortium constituted for this Project, either directly or indirectly or through any of their Associates.

3. Covenants

The Parties hereby undertake that in the event the Joint Venture is declared the selected Bidder and awarded the Project, it shall enter into an Contract Agreement with the Authority for performing all its obligations as the Service Provider in terms of the Contract Agreement for the Project.

4. Role of the Parties

The Parties hereby undertake to perform the roles and responsibilities as described below:

(a) Party of the First Part shall be the Lead member of the Consortium and shall have the power of attorney from all Parties for conducting all business for and on behalf of the Consortium during the Bidding Process and till the completion of Project as per Contract Agreement;

(b) Party of the Second Part shall be {the _____Member of the Consortium ;}

{(c) Party of the Third Part shall be the _____Member of the Consortium; and}

5. Joint and Several Liability

The Parties do hereby undertake to be jointly and severally responsible for all obligations and liabilities relating to the Project and in accordance with the terms of the RFP and the Contract Agreement, till such time as the completion of the Project is achieved under and in accordance with the Contract Agreement.

6. Stakes in the JV/ Consortium

The Parties agree that the proportion of stakes among the Parties in the JV/ Consortium shall be as follows:

First Party:

Second Party:

{Third Party:}

7. Representation of the Parties

Each Party represents to the other Parties as of the date of this Agreement that:

- (a) Such Party is duly organised, validly existing and in good standing under the laws of its incorporation and has all requisite power and authority to enter into this Agreement;
- (b) The execution, delivery and performance by such Party of this Agreement has been authorised by all necessary and appropriate corporate or governmental action and a copy of the extract of the charter documents and board resolution/ power of attorney in favour of the person executing this Agreement for the delegation of power and authority to execute this Agreement on behalf of the JV/ Consortium Member is annexed to this Agreement, and will not, to the best of its knowledge:
 - (i) require any consent or approval not already obtained;
 - (ii) violate any Applicable Law presently in effect and having applicability to it;
 - (iii) violate the memorandum and articles of association, by-laws or other applicable organisational documents thereof;
 - (iv) violate any clearance, permit, concession, grant, license or other governmental authorisation, approval, judgement, order or decree or any mortgage agreement, indenture or any other instrument to which such Party is a party or by which such Party or any of its properties or assets are bound or that is otherwise applicable to such Party; or
 - (v) create or impose any liens, mortgages, pledges, claims, security interests, charges or Encumbrances or obligations to create a lien, charge, pledge, security interest, encumbrances or mortgage in or on the property of such Party, except for encumbrances that would not, individually or in the aggregate, have a material adverse effect on the financial condition or prospects or business of such Party so as to prevent such Party from fulfilling its obligations under this Agreement;
- (c) this Agreement is the legal and binding obligation of such Party, enforceable in accordance with its terms against it; and
- (d) there is no litigation pending or, to the best of such Party's knowledge, threatened to which it or any of its Affiliates is a party that presently affects or which would have a material

adverse effect on the financial condition or prospects or business of such Party in the fulfillment of its obligations under this Agreement.

8. Termination

This Agreement shall be effective from the date hereof and shall continue in full force and effect until completion of the Project is achieved under and in accordance with the Contract Agreement, in case the Project is awarded to the JV/ Consortium. However, in case the JV/ Consortium is either not qualified for the Project or does not get selected for award of the Project, the Agreement will stand terminated in case the Bidder is not qualified or upon return of the Bid Security by the Authority to the Bidder, as the case may be.

9. Miscellaneous

9.1 This Joint Bidding Agreement shall be governed by laws of India.

9.2 The Parties acknowledge and accept that this Agreement shall not be amended by the Parties without the prior written consent of the Authority.

IN WITNESS WHEREOF THE PARTIES ABOVE NAMED HAVE EXECUTED AND DELIVERED THIS AGREEMENT AS OF THE DATE FIRST ABOVE WRITTEN.

SIGNED, SEALED AND DELIVERED

For and on behalf of
LEAD MEMBER by:

(Signature)
(Name)
(Designation)
(Address)

SIGNED, SEALED AND DELIVERED

SECOND PART

(Signature)
(Name)
(Designation)
(Address)

SIGNED, SEALED AND DELIVERED

For and on behalf of
THIRD PART

(Signature)
(Name)
(Designation)
(Address)

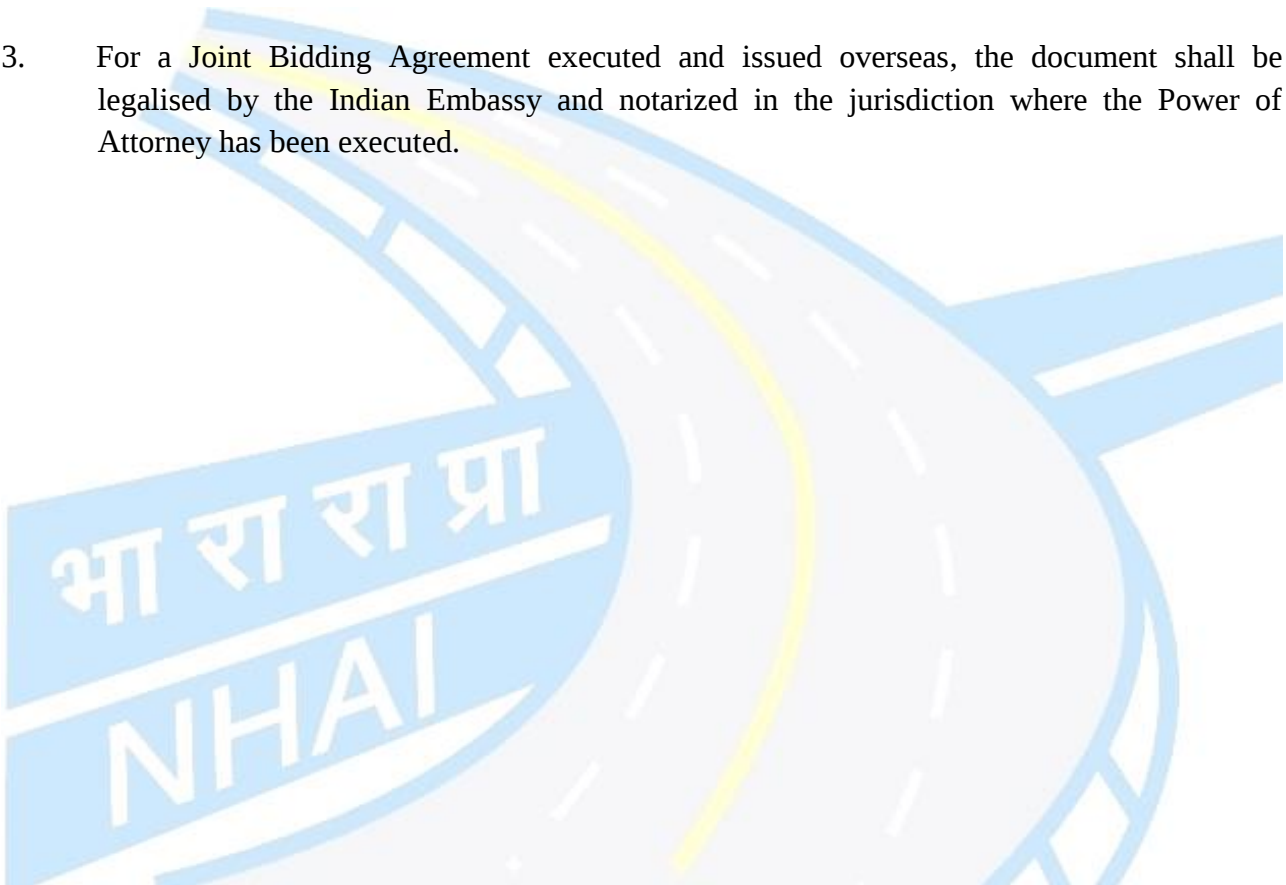
In the presence of:

1.

2.

Notes:

1. The mode of the execution of the Joint Bidding Agreement should be in accordance with the procedure, if any, laid down by the Applicable Law and the charter documents of the executant(s) and when it is so required, the same should be under common seal affixed in accordance with the required procedure. ***The Power of Attorney should be executed on a non-judicial stamp paper of appropriate denomination and should be duly notarised by a notary public.***
2. Each Joint Bidding Agreement should attach a copy of the extract of the charter documents and documents such as resolution / power of attorney in favour of the person executing this Agreement for the delegation of power and authority to execute this Agreement on behalf of the Consortium Member.
3. For a Joint Bidding Agreement executed and issued overseas, the document shall be legalised by the Indian Embassy and notarized in the jurisdiction where the Power of Attorney has been executed.



Form T-6: Format of submission of Work Experience / Technical Strength of Bidder

Sub.: RFP for Command and Control Centre including Video Conference, CCTV Surveillance & Monitoring of Vehicular Congestion on National Highway Toll Plazas

Ref: RFP No. NHAI/13051/01/2017-IT (Revised) dated 21/06/2017 on above subject.

Client Details Client Name: Address: Name of Contact Person: Contact No. Contact E-mail ID. (official e-mail ID)		Name of Work / Project ¹²
		Location:
		Approximate Value of Work / Project (INR)
Start Date		Present Status of Project (as per the Bidders mandate)
Completion Date		
Present Status		
Application Users		
Name of Persons Deployed (Key Persons only)		
Detailed features of Project Executed:		

Name

Designation/ Title of the Authorized Signatory.....

Dated: /...../2017

Note: Bidder should submit relevant details of each projects in this format and should enclose:

- (i) Go-live / acceptance / completion Certificate issued by the customer; and
 - (ii) Work Order / Purchase order / Copy of contract / Letter of Award
- highlighting detailed scope of project implemented within the last 5 financial years prior to the Bid due date as proof for the same.*

¹² Please furnish duly filled Form T-4 in support of each relevant project experience claimed

Form T-7: Affidavit on Litigation / Arbitration History
(on Non-judicial Stamp Paper of Value Rs.100/-)

Name of Bidder:

The Bidder should provide information on any history of litigation or arbitration resulting from the contracts executed for NHAI / MoRT&H in the last five years or currently under execution.

Year	Award for or against Bidders	Name of Client, Cause of Litigation and Matter in Dispute	Disputed Amount (Current Value in India Rs.)	Actual Awarded Amount in India Rs.

INFORMATION REGARDING CURRENT LITIGATION, DEBARRING / EXPELLING OF BIDDER OR ABANDONMENT OF WORK BY BIDDER

1. (a) Has the Bidder or its constituent partners history of litigation awarded against him?

Yes	No
-----	----

- (b) If yes, give details

.....

2. (a) Has the Bidder or any of its Constituent Partners or Directors been debarred / expelled, during the last 5 years as on the date of bid, on the basis of their performance in any assignment or for any other reason including fraudulent and corrupt practices, etc?

Yes	No
-----	----

- (b) If yes, give details including period of debarment:

.....

3. (a) Has the Bidder or any of its Constituent Partners or Directors failed to perform on any contract, during the last 5 years as on the date of bid, as evidenced by imposition of a penalty or a judicial pronouncement or arbitration award or has been expelled from any work or contract or have had any contract terminated for breach on their part or abandoned any contract work or has been declared bankrupt?

Yes	No
-----	----

- (b) If yes, give details

.....

Note: *If any information in this affidavit is found to be incorrect or concealed, prequalification / bid will be summarily rejected. Based on information in this affidavit, NHAI, in its sole discretion shall take a decision to prequalify the Bidder.*

Form T-8 Format of Certificate in respect of Bidder's Average Annual Turnover and Net Worth

CERTIFICATE (To be given by a Statutory Auditor)

Sub.: RFP for Command and Control Centre including Video Conference, CCTV Surveillance & Monitoring of Vehicular Congestion on National Highway Toll Plazas

Ref: RFP No. NHAI/13051/01/2017-IT (Revised) dated 21/06/2017 on above subject.

Dated: /...../2017

Certificate of Annual Turnover and Net Worth

It is certified that we have examined the audited books of accounts of M/s. _____ (name and address of the bidder) _____ and the details of the annual turnover during the last three financial years and net worth as on 31.03.2017 are as under:

a) Annual Turnover from Information Technology / Communication Technology / System Integration Business

Amount in Rs.

Financial Year¹³	Amount in figures	Amount in words
FY 2014-15		
FY 2015-16		
FY 2016-17		
Average of 3 years		

b) Net Worth

Amount in Rs.

As on¹⁴	Amount in figures	Amount in words
31.03.2017		

The break-up of above mentioned Net worth is mentioned below:

S. No.	Particulars	Amount as on 31.03.2017 (Rs. in Crore)
1.	Aggregate value of the paid-up share capital	XXX
2.	Add: all reserves created out of the profits	XXX
3.	Add: securities premium account	XXX
4.	Less: aggregate value of the accumulated losses	XXX
5.	Less: deferred expenditure	XXX
6.	Less: miscellaneous expenditure not written off	XXX
	NET WORTH (1+2+3-4-5-6-7)	XXX

Note: The reserves created out of revaluation of assets, write back of depreciation and

¹³ Please refer Note to clause 2.1 A (e) under Eligibility Criteria

¹⁴ Please refer Note to clause 2.1 A (e) under Eligibility Criteria

amalgamation have been excluded in the aforesaid calculation.

(Signature of *Statutory Auditor*)

Name:

Seal:

Place:

For (Name of Accounting Firm)

Name of Partner/Proprietor

Membership Number

Rubber Stamp



**Form T-9 Format for Submission of Detailed methodology and technical work plan
supported with broad system architecture and design.**

**Sub.: RFP for Command and Control Centre including Video Conference, CCTV Surveillance
& Monitoring of Vehicular Congestion on National Highway Toll Plazas**

Ref: RFP No. NHAI/13051/01/2017-IT (Revised) dated 21/06/2017 on above subject.

NOTE:

- i. Submission under this item is subject to evaluation under technical bid, while giving information, the bidders are advised to strictly focus and address the topic/sub-topic as asked for in a structured manner. Any superfluous submission shall be at bidders' risk*
ii. Bidder shall provide comprehensive list of proposed spares for each section.

Dated: /...../2017

(i) Detailed Methodology:

.....
.....
.....
.....
.....
.....
.....

(ii) Technical Work Plan:

.....
.....
.....
.....
.....
.....
.....

(iii) Broad system architecture and design proposed:

.....
.....
.....
.....
.....
.....
.....

(iv) Time schedule to complete the entire work under ToR, supported with Bar Chart:

.....
.....
.....
.....
.....

.....
.....
(v) Limitations on part of bidder to address requirements under ToR and SLA:

.....
.....
.....
.....
.....
.....
.....
(vi) Arrangements by bidder to address O&M Requirements:

.....
.....
.....
.....
.....
.....
(vii) Comments on Accuracy of information/data expected in RFP with justification:

.....
.....
.....
.....
.....
.....
(viii) Any other aspects the Bidder may wish to add:

Note: Following documents shall be enclosed along with this form

- (a) In case of any Non-Compliance in the ToR, Matrix thereof shall be submitted in the following format:

S. No.	RFP Clause & Page no.	RFP Provision	Non-compliance (details)	Remarks with alternate solution details

- (b) Technical details of each component, clearly mentioning the make, model, country of origin, and end of life of each component/ equipment as per the format given below, brief technical datasheet may also be enclosed in the following format for material approval certificate.
- (c) Please include all items mentioned under list of key components (Ref. Annexure to Form F-1).

Project:		Service Provider:		Client:	
Command and Control Centre including Video Conferencing, Comprehensive CCTV Surveillance & Monitoring of Vehicular Congestion on Toll Plaza along the NHs and Video based ATCC				National Highways Authority of India	
Toll Plaza/ Location:					
Material Approval Certificate				Discipline (ITS/ARC/CIV/MEP/EE)	(to be filled in by NHA)
				Date Close Out	(to be filled in by NHA)
Document No.		(to be filled in by Service Provider)			
Service Provider				Contract No.	
				Date	
We request the approval to the following for use on the above contract					
Document Title					
Works / Building					
Sub-Location					
Contractor / Sub-Contractor / OEM					
Contract Specifications Clause					
Technical Details (Make, model, country of origin, MTTR, MTBF, OEM warranty, end of life and other tech. details as applicable for each)					
Construction Drawing No. / Reference					
Estimated Date Required On Site					
Enclosures (samples, data, data sheet, test results, technical documentation, etc.)					
Meets / Doesn't Meets Requirement		☐ Yes	☐ No	In case of non-compliance please submit comparison statement.	
We certify that the above submitted item has been reviewed in detail and is correct and in strict conformance with the contract, drawings and specifications except as otherwise stated above.					
		Date			
Name				Authorized Representative of Service Provider	
Client		Date received			
Routing:	Project Manager	Architectural	Civil	IT	Electronics
for action					
for info					
☐	Approved	☐	Approved with comments	☐	Rejected
Comments:					
Date Approved/Rejected		Date Authorized			
Name		Name			
Authorized Representative of NHA					

**Form T-10 Details of Certification(s), Affiliation(s),
Authorised Partner(s) of OEM/Other leading technology providers/
System Integrators, supported with certified copies.**

Sub.: RFP for Command and Control Centre including Video Conference, CCTV Surveillance & Monitoring of Vehicular Congestion on National Highway Toll Plazas

Ref: RFP No. NHAI/13051/01/2017-IT (Revised) dated 21/06/2017 on above subject.

Dated: /...../2017

Sr. No.	Particulars of Certification(s), Affiliation(s), International rating(s), Authorised Partner(s)	Details of Technology Partner or Agency granting certification, affiliation, etc.	Year of Achievement	Validity (if any)
1				
2				
3				
4				
5				
6				

Please add additional rows, if required.



Form T-11 Format for Bank Guarantee towards Bid Security

BG No.

Date

To,
The Chairman
National Highways Authority of India
G-5&6, Sector – 10 Dwarka,
New Delhi - 110075

1. In consideration of “National Highways Authority of India (NHAI)” (hereinafter referred to as the “Authority”, which expression shall unless it be repugnant to the subject or context thereof include its successors and assigns) having agreed to receive the bid of M/s and having its registered office at (and acting on behalf of its JV/ Consortium) (hereinafter referred to as the “Bidder” which expression shall unless it be repugnant to the subject or context thereof, include its/ their successors, administrators, executors and assigns), for submission of bids for the works of (hereinafter called the “Works”) pursuant to RFP No. NHAI/13051/01/2017-IT (Revised) dated 21/06/2017 of the Authority, and the bidder having agreed to furnish a Bank Guarantee to the Authority as “Bid Security” for the purpose indicated in the said RFP, we, (Name of the Bank) having our registered office at and one of its branches at, a body registered / constituted under the (hereinafter referred to as the Bank), which expression shall, unless it be repugnant to the subject or context thereof, include its successors, administrators, executors and assigns at the request of the bidder, do hereby in terms of RFP document, irrevocably, unconditionally and without reservation guarantee the due and faithful fulfillment and compliance of the terms and conditions of the RFP document by the said bidder and unconditionally and irrevocably undertake to pay forthwith to the Authority an amount of Rs. 1,50,00,000/- (Rupees one crore and fifty lakh only) (hereinafter referred to as the “Guarantee”) as aforesaid at any time up to as our primary obligation without any demur, reservation, recourse, contest or protest and without reference to the Bidder if the Bidder shall fail to fulfil or comply with all or any of the terms and conditions contained in the said RFP Document.
2. Any such written demand made by the Authority stating that the Bidder is in default of the due and faithful fulfilment and compliance with the terms and conditions contained in the RFP / Bidding Documents shall be final, conclusive and binding on the bank.
3. We, the Bank, do hereby unconditionally undertake to pay the amounts due and payable under this Guarantee without any demur, reservation recourse, contest or protest and without any reference to the Bidder or any other person and irrespective of whether the claim of the Authority is disputed by the Bidder or not, merely on the first demand from the Authority stating that the amount claimed is due to the Authority by reason of failure of the Bidder to fulfil and comply with the terms and conditions contained in the RFP/ Bidding Documents including failure of the said Bidder to keep its Bid open during the Bid validity period as set forth in the said RFP / Bidding Document for any reason whatsoever. Any

such demand made on the bank shall be conclusive as regards amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding Rs. 1,50,00,000/- (Rupees one crore and fifty lakh only).

4. This Guarantee shall be irrevocable and remain in full force upto inclusive of a claim period of 60 (sixty) days or for such extended period as may be mutually agreed between the Authority and the Bidder, and agreed to by the Bank, and shall continue to be enforceable till all amounts under this Guarantee have been paid.
5. We, the Bank, further agree that the Authority shall be the sole judge to decide as to whether the Bidder is in default of due and faithful fulfillment and compliance with the terms and conditions contained in the RFP/ Bidding Documents including, inter alia, the failure of the Bidder to keep its Bid open during the Bid validity period set forth in the said Bidding Documents, and the decision of the Authority that the Bidder is in default as aforesaid shall be final and binding on us, notwithstanding any differences between the Authority and the Bidder or any dispute pending before any Court, Tribunal, Arbitrator or any other Authority.
6. The Guarantee shall not be affected by any change in the constitution or winding up of the Bidder or the Bank or any absorption, merger or amalgamation of the Bidder or the Bank with any other person.
7. In order to give full effect to this Guarantee, the Authority shall be entitled to treat the Bank as the principal debtor. The Authority shall have the fullest liberty without affecting in any way the liability of the Bank under this Guarantee from time to time to vary any of the terms and conditions contained in the said RFP / Bidding Documents or to extend time for submission of the Bids or the Bid validity period or the period for conveying acceptance of Letter of Award by the Bidder or the period for fulfilment and compliance with all or any of the terms and conditions contained in the said RFP / Bidding Documents by the said Bidder or to postpone for any time and from time to time any of the powers exercisable by it against the said Bidder and either to enforce or forbear from enforcing any of the terms and conditions contained in the said RFP/ Bidding Documents or the securities available to the Authority, and the Bank shall not be released from its liability under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the said Bidder or any other forbearance, act or omission on the part of the Authority or any indulgence by the Authority to the said Bidder or by any change in the constitution of the Authority or its absorption, merger or amalgamation with any other person or any other matter or thing whatsoever which under the law relating to sureties would but for this provision have the effect of releasing the Bank from its such liability.
8. Any notice by way of request, demand or otherwise hereunder shall be sufficiently given or made if addressed to the Bank and sent by courier or by registered mail to the Bank at the address set forth herein.
9. We undertake to make the payment on receipt of your notice of claim on us addressed to [name of Bank along with branch address] and delivered at our above branch which shall be deemed to have been duly authorized to receive the said notice of claim.
10. It shall not be necessary for the Authority to proceed against the said Bidder before proceeding against the Bank and the guarantee herein contained shall be enforceable against the Bank, notwithstanding any other security which the Authority may have obtained from

the said Bidder or any other person and which shall, at the time when proceedings are taken against the Bank hereunder, be outstanding or unrealized.

11. We, the Bank, further undertake not to revoke this Guarantee during its currency except with the previous express consent of the Authority in writing.
12. The Bank declares that it has power to issue this Guarantee and discharge the obligations contemplated herein, the undersigned is duly authorized and has full power to execute this Guarantee for and on behalf of the Bank.
13. This guarantee shall also be operatable at our _____ branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension/ renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

14. This bank guarantee shall be valid from

15. Notwithstanding anything contained herein:

- (i) Our liability under this Bank Guarantee shall not exceed Rs./-
- (ii) The Bank Guarantee shall be valid up to.....
- (iii) We are liable to pay the Guarantee amount or any part thereof under this Guarantee only and only if you serve upon us a written claim or demand on or before

Signed and Delivered by Bank.

By the hand of Mr. / Ms., its and authorize official.

(Signature of the Authorised Signatory)
(Name & Designation with Bank's Official Seal)

NOTE:

- (i) The bank guarantee(s) shall contain the name, designation and code number of the officer(s) signing the guarantee(s);
- (ii) The address, telephone no. and other details of the Head Office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing Branch.
- (iii) The bank guarantee shall be signed by the officials as per the norms prescribed by the RBI in this regard.

Form T-12: PROFORMA FOR SUBMITTING WRITTEN QUERIES

(To be submitted in doc/editable format only at the given email address¹⁵)

Sub.: RFP for Command and Control Centre including Video Conference, CCTV Surveillance & Monitoring of Vehicular Congestion on National Highway Toll Plazas

Ref: RFP No. NHAI/13051/01/2017-IT (Revised) dated 21/06/2017 on above subject.

Name of Company: _____,

Name of Person _____

Contact No. _____,

Email Id: _____

S.	Page no. of RFP	Clause	RFP Statement	Query	Remarks

¹⁵ deepaksaxena@nhai.org

Form F-1: Format for Financial Bid Submission

(For sample only, actual Format to be downloaded from e-tender portal for on-line submission)

Sub.: RFP for Command and Control Centre including Video Conference, CCTV Surveillance & Monitoring of Vehicular Congestion on National Highway Toll Plazas

Ref: RFP No. NHAI/13051/01/2017-IT (Revised) dated 21/06/2017 on above subject.

Dear Sir,

I/We, the undersigned having examined the above referred RFP including addendums thereof and, hereby offer to submit our bid to undertake the subject assignment with total bid value as per milestone and break-up furnished below.

S. No.	Control Centre Unit (CC Unit)	Units	Quantity	Unit Rate	Amount (In Rs.)
	A	B	C	D	E = C X D
CAPEX					
1	Services as per ToR at Command & Control Centre (CCC) at NHAI HQ	LS	1	XX	XXX
2	Services as per ToR at Regional Control Centre (RCC) at NHAI RO Type-1	LS	8	XX	XXX
3	Services as per ToR at Regional Control Centre (RCC) at NHAI RO Type-2	LS	6	XX	XXX
4	Services as per ToR at Regional Control Centre (RCC) at NHAI RO Type-3	LS	8	XX	XXX
5	Services as per ToR at Type-I Toll plazas (16 & more toll lanes) (2PTZ + 4 fixed camera configuration)	LS	32	XX	XXX
6	Services as per ToR at Type-II Toll plazas (less than 16 toll lanes) (2PTZ + 2 fixed camera configuration)	LS	348	XX	XXX
	Sub-Total (A): CAPEX				XXX
OPEX					
S. No.	Control Centre Unit (CC Unit)	Units	Quantity	Unit Rate per quarter	Amount per quarter (In Rs.)
1	CCC at NHAI HQ O&M	LS	1	XX	XXX
2	RCC at RO Type-1 O&M	LS	8	XX	XXX
3	RCC at RO Type-2 O&M	LS	6	XX	XXX
4	RCC at RO Type-3 O&M	LS	8	XX	XXX
5	Toll Plaza - Type I (16 toll lanes or more) - O&M	LS	32	XX	XXX
6	Toll Plaza - Type II (less than 16 toll lanes) - O&M	LS	348	XX	XXX
	Sub-Total (B): OPEX				XXX
	(C) Total Bid Value (90% of A + 20 times of B)				XXX
	(D) Amount to be paid as per Clause 11 of Contract Agreement (30% of A after completion of each phase, as applicable)				XXX
	(E) Balance Amount for which Annuity will be payable to the Service Provider after implementation of complete project (C – D)				XXX
	(F) Equal Quarterly Annuity (E/20)				XX

Notes:

1. Total bid value is determined based on summation of 90% of CAPEX quoted above and 20 times of OPEX quoted above for the purpose of bid evaluation only. The Total Bid Value shall constitute the sole criteria for evaluation. Subject to provisions of RFP, the Project will be awarded to the Bidder quoting the lowest quoted Bid Value.
2. Actual Payment to the Service Provider may vary based on the terms and conditions of the Contract Agreement.
3. The term of the Contract Agreement for the project shall be for a period of 6 (six) years with effect from Effective Date, with the initial one year as the implementation period (which will be executed in 3 phases as detailed in clause 11 of draft Contract Agreement prescribed in the RFP) and the balance period starting from immediately succeeding the completion of each phase and upto the end of the term of the Contract Agreement as operation and maintenance period. Any additional implementation work awarded during this 6 year period shall be adjusted as implementation and O& M in such a manner that the said period does not exceed beyond the initial six years or additional extended period thereof, if approved by NHAI, as the case may be.
4. Indicative list of key components is annexed to this financial bid format (Form F-1), Service provider shall provide item-wise rates for each component proposed as well as any additional item deemed necessary by the Service Provider to ensure completeness. Service Provider shall also provide comprehensive list of proposed spares for each section. All values must be verified before Submission, in case of any errors/ incompleteness, Service Provider shall be responsible, and no additional items/ claims for the payments shall be entertained.
5. Above breakup of rates is only for determining the total bid value for shortlisting the successful bidder for work award. However actual payments shall be regulated based on the actual number of locations where services as per ToR were delivered during the billing period.
6. The number of locations mentioned above are indicative only and NHAI reserves the right to increase or decrease the number of actual locations intended to be covered under the contract.
7. I/We do hereby confirm that my/ our bid price include all statutory taxes/ levies but excluding service tax/ GST (as applicable on the services). I/ We also declare that any tax, surcharge on tax and / or any other levies, if altered in future and payable under the law, the same shall be borne by me/ us.
8. The quoted rates for all items shall remain unchanged for entire term of the Contract Agreement. In case there is increase or decrease in any item(s) to be installed on any CC unit requisitioned by NHAI, then the payments to the Service Provider shall get increased or decreased, as the case may be, in reference to the quoted price in the financial bid and/or as assessed by the Authority's Engineer in case item is not mentioned in the financial bid. However, in case NHAI decides to increase the term of the Contract pursuant to clause 7(b) contemplated in the draft Contract Agreement, in that case payment of OPEX will be revised as per Note to clause 12(l) of the draft Contract Agreement.
9. This bid is **valid** for a period of **120 calendar days** from the bid due date.
10. I/ We, understand that the
 - (a) applicable service tax/ GST (as applicable on services) shall be reimbursed by NHAI separately on production of proof of payment and CA certificate; and

- (b) TDS will be deducted against payments as per Applicable Law.
- (c) In case of any difference in figures and words, the amount mentioned in words will prevail.

Yours sincerely,

Name

Designation/ Title of the Authorized Signatory.....



Annexure to Form F-1 Indicative list of key Components

S.No.	Items	Unit	Qty (per location)	Unit Price	Total Price	Make	Model	Brief Specifications	Country of Origin	Procurement (local/imported)	Delivery lead time	Product Shelf Life	Compliant to T&R (Y/N)	If Non-Compliant - Specify the reason	Remarks
1	Services as per TOR at Command & Control Centre (CCC) at NHAIHQ														
	Command & Control Centre (CCC) Equipment														
1.1	24 port switch (Layer 3 managed switch)	Nos.	2		0										
1.2	Core switch	Nos.	1		0										
1.3	Router	Nos.	2		0										
1.4	Firewall	Nos.	2		0										
1.5	Servers (Application, Video Analytics, NMS, AAA, MCU) (minimum qty.)	Nos.	5		0										
1.6	Storage	Nos.	1		0										
1.7	All-in-one Workstation for operators & supervisor	Nos.	4		0										
1.8	All-in-one Workstation for Conference desk (roll in roll out mechanism)	Nos.	3		0										
1.9	A3 Printer	Nos.	1		0										
1.10	Later DLP Videowall - Controller	Nos.	1		0										
1.11	MCU (Multi-party Conferencing) for VC	Nos.	1		0										
1.12	VC Setup	Nos.	1		0										
1.13	IP Phones - basic	Nos.	2		0										
1.14	IP Phones - video	Nos.	1		0										
1.15	Rack for servers & switches	Nos.	2		0										
1.16	Command & Control Software	LS	1		0										
1.17	Software based VC application for Tab/ Mobile / Laptop of Project Directors (PDs)	Nos.	125		0										
1.18	Video Management system (Software)	LS	1		0										
1.19	Video Analytics and Synopsis system (software)	LS	1		0										
1.2	Antivirus for workstations	Nos.	7		0										
1.21	Antivirus for servers (if required)	Nos.	5		0										
1.22	Latest MS office professional	Nos.	7		0										
1.23	Technical Furniture	LS	1		0										
1.24	Interior and furnishing of control room	LS	1		0										
1.25	Chair	Nos.	45		0										
1.26	Power distribution panel	Nos.	1		0										
1.27	UPS (Kindly specify the rating here)	Nos.	1		0										
1.28	Battery bank (Kindly specify the rating here)	Nos.	1		0										
1.29	Surge Protection Devices (Type-1 SPD)	Nos.	2		0										
1.30	STP CAT 6 cable as per requirement in TOR	m	LS		0										
1.31	Power cable as per requirement in TOR (Kindly specify the rating here)	m	LS		0										
1.32	Conduiting as per requirement in TOR (Kindly specify the type)	m	LS		0										
1.33	Network Surge Protection Device for POE (if required)	Nos.	as per requirement		0										
1.34	Earthing (if required)	Nos.	as per requirement		0										
1.35	Installation, Testing, Commissioning & Training	LS	1		0										
1.36	All applicable taxes	LS	1		0										
1.37					0										
1.38					0										
1.39					0										
1.40					0										
1.41					0										
1.42					0										
1.43					0										
1.44					0										
1.45					0										
1.46					0										
1.47					0										
1.48					0										
	Total 1 (CCC Equipment)				0										
Please add additional items in the blank rows above, if Any other item required as per the TOR at your solution design															

S.No.	Item	Unit	Qty (per location)	Unit Price	Total Price	Make	Model	Brief Specifications	Country of Origin	Procurement (local/ Imported)	Delivery lead time	Product's Shelf Life	Compliant to ToR (Y/N)	If Non-Compliant - Specify the reason	Remarks
2	Services as per TOR at Regional Control Centre (RCC) at NHAI RO Type-1														
	Type-1 RCC Equipment														
2.1	24 port switch (Layer 3 managed switch)	Nos.	2		0										
2.2	MPLS Link (Hub) Router for RO Type-1	Nos.	1		0										
2.3	Firewall for RO Type-1	Nos.	1		0										
2.4	Servers (Application Server & Video Server)	Nos.	2		0										
2.5	Storage for RO Type-1	Nos.	1		0										
2.6 & 2	Laser DLP Videowall +Controller for RO Type 1	Nos.	1		0										
2.7	All-in-one Workstation	Nos.	3		0										
2.8	All-in-one Workstation for Conference desk (roll in roll out mechanism)	Nos.	1		0										
2.9	VC Setup (Codec & Camera)	Nos.	1		0										
2.10	IP Phones - basic	Nos.	1		0										
2.11	IP Phones - video	Nos.	1		0										
2.12	Rack for servers & switches	Nos.	1		0										
2.13	A 4 Printer	Nos.	1		0										
2.14	VideoManagement system (software)	LS	1		0										
2.15	Video Analytics and Synopsis system (software)	LS	1		0										
2.16	Antivirus for workstations	Nos.	3		0										
2.17	Antivirus for servers (if required)	Nos.	2		0										
2.18	Latest MS office professional	Nos.	3		0										
2.19	Technical Furniture	LS	1		0										
2.20	Interior and furnishing of control room	LS	1		0										
2.21	Chair	Nos.	8		0										
2.22	Power distribution panel	Nos.	1		0										
2.23	Surge Protection Devices (Type-1 SPD)	Nos.	1		0										
2.24	UPS (Kindly specify the rating here)	Nos.	1		0										
2.25	Battery bank (Kindly specify the rating here)	Set	1		0										
2.26	Power cable as per requirement in TOR (Kindly specify the rating here)	m	LS		0										
2.27	Conducting as per requirement in TOR	m	LS		0										
2.28	STP CAT 6 cable as per requirement in TOR	m	LS		0										
2.29	Network Surge Protection Device for POE (if required)	Nos.	as per requirement		0										
2.30	Earthing	Nos.	1		0										
2.31	Installation, Testing, Commissioning & Training	LS	1		0										
2.32	All applicable taxes	LS	1		0										
2.33					0										
2.34					0										
2.35					0										
2.36					0										
2.37					0										
2.38					0										
2.39					0										
2.40					0										
2.41					0										
2.42					0										
2.43					0										
2.44					0										
Total 2 (Type-1 RCC Equipment)					0										
Please add additional items in the blank rows above, if Any other item required as per the ToR or your solution design															

S.No.	Item	Unit	Qty (per location)	Unit Price	Total Price	Make	Model	Brief Specifications	Country of Origin	Procurement (local/ imported)	Delivery lead time	Product Shelf Life	Compliant to Takt (Y/N)	If Non-Compliant - Specify the reason	Remarks
3	Services as per TOR at Regional Control Centre (RCC) at NHAI RO Type-2														
	Type-2 RCC Equipment														
3.1	24 port switch (Layer 3 managed switch)	Nos.	1		0										
3.2	MPLS Link (Hub) Router for RO Type-2	Nos.	1		0										
3.3	Firewall for RO Type-2	Nos.	1		0										
3.4	Servers (Application Server & Video Server)	Nos.	2		0										
3.5	Storage for RO Type-2	Nos.	1		0										
3.6	Laser DLP Videowall +Controller for RO Type 1 & 2	Nos.	1		0										
3.7	All-in-one Workstation	Nos.	3		0										
3.8	All-in-one Workstation for Conference desk (roll in roll out mechanism)	Nos.	1		0										
3.9	VC Setup (Codec & Camera)	Nos.	1		0										
3.10	IP Phones - basic	Nos.	1		0										
3.11	IP Phones - video	Nos.	1		0										
3.12	Rack for servers & switches	Nos.	1		0										
3.13	A 4 Printer	Nos.	1		0										
3.14	VideoManagement system (software)	LS	1		0										
3.15	Video Analytics and Synopsis system (software)	LS	1		0										
3.16	Antivirus for workstations	Nos.	3		0										
3.17	Antivirus for servers (if required)	Nos.	2		0										
3.18	Latest MS office professional	Nos.	3		0										
3.19	Technical Furniture	LS	1		0										
3.20	Interior and furnishing of control room	LS	1		0										
3.21	Chair	Nos.	8		0										
3.22	Power distribution panel	Nos.	1		0										
3.23	Surge Protection Devices (Type-1 SPD)	Nos.	1		0										
3.24	UPS (Kindly specify the rating here)	Nos.	1		0										
3.25	Battery bank (Kindly specify the rating here)	Set	1		0										
3.26	Power cable as per requirement in TOR (Kindly specify the rating here)	m	LS		0										
3.27	Conduiting as per requirement in TOR	m	LS		0										
3.28	STP CAT 6 cable as per requirement in TOR	m	LS		0										
3.29	Network Surge Protection Device for POE (if required)	Nos.	as per requirement		0										
3.30	Earthing	Nos.	1		0										
3.31	Installation, Testing, Commissioning & Training	LS	1		0										
3.32	All applicable taxes	LS	1		0										
3.33					0										
3.34					0										
3.35					0										
3.36					0										
3.37					0										
3.38					0										
3.39					0										
3.40					0										
3.41					0										
3.42					0										
3.43					0										
3.44					0										
Total 3 (Type-2 RCC Equipment)					0										
Please add additional items in the blank rows above, if Any other item required as per the ToR or your solution design															

S.No.	Item	Unit	Qty (per location)	Unit Price	Total Price	Make	Model	Brief Specifications	Country of Origin	Procurement (local/ Imported)	Delivery lead time	Product Shelf Life	Compliant to ToR (Y/N)	If Non-Compliant - Specify the reason	Remarks
4	Services as per TOR at Regional Control Centre (RCC) at NHAI RO Type-3														
	Type-3 RCC Equipment														
4.1	24 port switch (Layer 3 managed switch)	Nos.	1		0										
4.2	MPLS Link (Hub) Router for RO Type-3	Nos.	1		0										
4.3	Firewall for RO Type-3	Nos.	1		0										
4.4	Server (Application & Video Server)	Nos.	1		0										
4.5	3m X 0.80m size Laser DLP Videowall +Controller for RO Type 3	Nos.	1		0										
4.6	Storage for RO Type-3	Nos.	1		0										
4.7	All-in-one Workstation	Nos.	2		0										
4.8	All-in-one Workstation for Conference desk (roll in roll out mechanism)	Nos.	1		0										
4.9	VC Setup (Codec & Camera)	Nos.	1		0										
4.10	IP Phones - basic	Nos.	1		0										
4.11	IP Phones - video	Nos.	1		0										
4.12	Rack for servers & switches	Nos.	1		0										
4.13	A 4 Printer	Nos.	1		0										
4.14	VideoManagement system (software)	LS	1		0										
4.15	Video Analytics and Synopsis system (software)	LS	1		0										
4.16	Antivirus for workstations	Nos.	2		0										
4.17	Antivirus for servers (if required)	Nos.	1		0										
4.18	Latest MS office professional	Nos.	2		0										
4.19	Technical Furniture	LS	1		0										
4.20	Interior and furnishing of control room	LS	1		0										
4.21	Chair	Nos.	8		0										
4.22	Power distribution panel	Nos.	1		0										
4.23	Surge Protection Devices (Type-1 SPD)	Nos.	1		0										
4.24	UPS (Kindly specify the rating here)	Nos.	1		0										
4.25	Battery bank (Kindly specify the rating here)	Set	1		0										
4.26	Power cable as per requirement in TOR (Kindly specify the rating here)	m	LS		0										
4.27	Conduiting as per requirement in TOR	m	LS		0										
4.28	STP CAT 6 cable as per requirement in TOR	m	LS		0										
4.29	Network Surge Protection Device for POE (if required)	Nos.	as per requirement		0										
4.30	Earthing	Nos.	1		0										
4.31	Installation, Testing, Commissioning & Training	LS	1		0										
4.32	All applicable taxes	LS	1		0										
4.33					0										
4.34					0										
4.35					0										
4.36					0										
4.37					0										
4.38					0										
4.39					0										
4.40					0										
4.41					0										
4.42					0										
4.43					0										
4.44					0										
Total 4 (Type-3 RCC Equipment)					0										
Please add additional items in the blank rows above, if Any other item required as per the ToR or your solution design															

S.No.	Items	Unit	Qty (per location)	Unit Price	Total Price	Make	Model	Brief Specifications	Country of Origin	Procurement (local/ imported)	Delivery lead time	Product Shelf Life	Compliant to Tilt (Y/N)	If Non-Compliant - Specify the reason	Remarks
5	Services as per TOR at Type-1 Toll plaza (16 & more toll lanes) (PTZ = 4 fixed camera configuration)														
	Type-1 Toll Plaza Equipment														
5.1	PTZ Camera	Nos.	2		0										
5.2	Fixed CCTV Camera	Nos.	4		0										
5.3	Video analytics h/w module (if required)	Nos.	4		0										
5.4	64 GB micro SD Card	Nos.	4		0										
5.5	128 GB micro SD Card	Nos.	2		0										
5.6	Pole for Mounting camera	Nos.	4		0										
5.7	Pole Foundation and accessories	LS	4		0										
5.8	Enclosure mounted on camera pole	Nos.	4		0										
5.9	4-Port Rugged PoE switch (installed inside the enclosure mounted on pole)	Nos.	4		0										
5.10	8-Port non-rugged switch	Nos.	1		0										
5.11	High End Video Endpoint 23" touch screen (for VC)	Nos.	1		0										
5.12	All-in-one Workstation	Nos.	1		0										
5.13	Antivirus	Nos.	1		0										
5.14	Latest MS office professional	Nos.	1		0										
5.15	UPS (Kindly specify the rating here)	Nos.	1		0										
5.16	Battery bank (Kindly specify the rating here)	Nos.	1		0										
5.17	Technical Furniture	LS	1		0										
5.18	Chair	Nos.	2		0										
5.19	STP CAT 6 cable as per requirement in TOR	m	LS		0										
5.20	Power cable as per requirement in TOR (Kindly specify the rating here)	m	LS		0										
5.21	1 Gig Multi mode Optical fiber cable as per requirement in TOR	m	LS		0										
5.22	PLB HDPE duct (Telecom grade) 32mm OD as per requirement in TOR	m	LS		0										
5.23	MPLS Link OTC	LS	1		0										
5.24	Router for MPLS link (25 MBPS)	Nos.	1		0										
5.25	Power distribution panel	Nos.	1		0										
5.26	Surge Protection Devices (Type-1 SPD)	Nos.	2		0										
5.27	Network Surge Protection Device for POE	Nos.	10		0										
5.28	Earthing	Nos.	1		0										
5.29	Installation, Testing, Commissioning & Training	LS	1		0										
5.30	Video Management Software (VMS)	LS	1		0										
5.31	All applicable taxes	LS	1		0										
5.32					0										
5.33					0										
5.34					0										
5.35					0										
5.36					0										
5.37					0										
5.38					0										
5.39					0										
5.40					0										
5.41					0										
5.42					0										
5.43					0										
Total 5 (Type-1 Toll Plaza Equipment)					0										
Please add additional items in the blank rows above, if Any other item required as per the Toll or your solution design															

S.No.	Item	Unit	Qty (per location)	Unit Price	Total Price	Make	Model	Brief Specifications	Country of Origin	Procurement (local/ imported)	Delivery lead time	Product shelf life	Compliant to Toll (Y/N)	If Non-Compliant - Specify the reason	Remarks
6	Services as per TOR at Type-II Toll plazas (less than 16 toll lanes) (2PTZ + 2 fixed camera configuration)														
	Type-2 Toll Plaza Equipment														
6.1	PTZ Camera	Nos.	2		0										
6.2	Fixed CCTV Camera	Nos.	2		0										
6.3	Video analytics h/w module	Nos.	2		0										
6.4	64 GB micro SD Card	Nos.	2		0										
6.5	128 GB micro SD Card	Nos.	2		0										
6.6	Pole for Mounting camera	Nos.	2		0										
6.7	Pole Foundation and accessories	LS	2		0										
6.8	Enclosure mounted on camera pole	Nos.	2		0										
6.9	4-Port Rugged PoE switch (installed inside the enclosure mounted on pole)	Nos.	2		0										
6.10	8-Port non-rugged switch	Nos.	1		0										
6.11	High End Video Endpoint 23" touch screen (for VC)	Nos.	1		0										
6.12	All-in-one Workstation	Nos.	1		0										
6.13	Antivirus	Nos.	1		0										
6.14	Latest MS office professional	Nos.	1		0										
6.15	UPS (Kindly specify the rating here)	Nos.	1		0										
6.16	Battery bank (Kindly specify the rating here)	Nos.	1		0										
6.17	Technical Furniture	LS	1		0										
6.18	Chair	Nos.	2		0										
6.19	STP CAT 6 cable as per requirement in TOR	m	LS		0										
6.20	Power cable as per requirement in TOR (Kindly specify the rating here)	m	LS		0										
6.21	1 Gig Multi mode Optical fiber cable as per requirement in TOR	m	LS		0										
6.22	PLB HDPE duct (Telecom grade) 32mm OD as per requirement in TOR	m	LS		0										
6.23	MPLS Link OTC	LS	1		0										
6.24	Router for MPLS link (25 MBPS)		1		0										
6.25	Power distribution panel	Nos.	1		0										
6.26	Surge Protection Devices (Type-1 SPD)	Nos.	2		0										
6.27	Network Surge Protection Device for POE	Nos.	6		0										
6.28	Earthing	Nos.	1		0										
6.29	Installation, Testing, Commissioning & Training	LS	1		0										
6.30	Video Management Software (VMS)	LS	1		0										
6.31	All applicable taxes	LS	1		0										
6.32					0										
6.33					0										
6.34					0										
6.35					0										
6.36					0										
6.37					0										
6.38					0										
6.39					0										
6.40					0										
6.41					0										
6.42					0										
6.43					0										
Total 6 (Type-II Toll Plaza Equipment)					0										
Please add additional items in the blank rows above, if any other item required as per the TOR or your solution design															

S.No	Items	Unit	Qty (per location)	Unit Price	Total Price (Quarterly)	Compliance to ToR (Y/N)	If Non-Compliant - Specify the reason	Remarks
7	Operations & Maintenance Services as per TOR at Command & Control Centre (CCC) at NHAI HQ							
	CCC O&M (Quarterly)							
7.1	Manpower	Monthly	3		0			
7.2	Maintenance cost (AMC, Insurance, Interest, contingency etc.)	Monthly	3		0			
7.3	All applicable taxes	Monthly	3		0			
7.4					0			
7.5					0			
7.6					0			
	Total 7 (CCC O&M)				0			
Please add additional items in the blank rows above, if Any other item required as per the ToR or your solution design								

S.No	Items	Unit	Qty (per location)	Unit Price	Total Price (Quarterly)	Compliant to ToR (Y/N)	If Non-Compliant - Specify the reason	Remarks
8	Operations & Maintenance Services as per TOR at Regional Control Centre (RCC) at NHAI RO Type-1							
	Type-1 RCC O&M (Quarterly)							
8.1	MPLS recurring charges	Monthly	3		0			
8.2	Manpower	Monthly	3		0			
8.3	Maintenance cost (AMC, Insurance, Interest, contingency etc.)	Monthly	3		0			
8.4	All applicable taxes	Monthly	3		0			
8.5					0			
8.6					0			
8.7					0			
	Total 8 (Type-1 RCC O&M)				0			
Please add additional items in the blank rows above, if Any other item required as per the ToR or your solution design								

S.No.	Items	Unit	Qty (per location)	Unit Price	Total Price (Quarterly)	Compliance to ToR (Y/N)	If Non-Compliant - Specify the reason	Remarks
9	Operations & Maintenance Services as per TOR at Regional Control Centre (RCC) at NHAI RO Type-2							
	Type-2 RCC O&M (Quarterly)							
9.1	MPLS recurring charges	Monthly	3		0			
9.2	Manpower	Monthly	3		0			
9.3	Maintenance cost (AMC, Insurance, Interest, contingency etc.)	Monthly	3		0			
9.4	All applicable taxes	Monthly	3		0			
9.5					0			
9.6					0			
9.7					0			
	Total 9 (Type-2 RCC O&M)				0			
Please add additional items in the blank rows above, if Any other item required as per the ToR or your solution design								

S.No.	Items	Unit	Qty (per location)	Unit Price	Total Price (Quarterly)	Compliant to ToR (Y/N)	If Non-Compliant - Specify the reason	Remarks
10	Operations & Maintenance Services as per TOR at Regional Control Centre (RCC) at NHAI RO Type-3							
	Type-3 RCC O&M (Quarterly)							
10.1	MPLS recurring charges	Monthly	3		0			
10.2	Manpower	Monthly	3		0			
10.3	Maintenance cost (AMC, Insurance, Interest, contingency etc.)	Monthly	3		0			
10.4	All applicable taxes	Monthly	3		0			
10.5					0			
10.6					0			
10.7					0			
	Total 10 (Type-3 RCC O&M)				0			
<i>Please add additional items in the blank rows above, if Any other item required as per the ToR or your solution design</i>								

S.No.	Items	Unit	Qty (per location)	Unit Price	Total Price (Quarterly)	Compliant to ToR (Y/N)	If Non-Compliant - Specify the reason	Remarks
11	Operations & Maintenance Services as per TOR at Type-I Toll plazas (16 & more toll lanes) (2PTZ + 4 fixed camera configuration)							
	Type-I Toll Plaza O&M (Quarterly)							
11.1	8 MBPS MPLS recurring charges	Monthly	3		0			
11.2	Manpower	Monthly	3		0			
11.3	Maintenance cost (AMC, Insurance, Interest, contingency etc.)	Monthly	3		0			
11.4	All applicable taxes	Monthly	3		0			
11.5					0			
11.6					0			
11.7					0			
	Total 11 (Type-I Toll Plaza O&M)					0		
Please add additional items in the blank rows above, if Any other item required as per the ToR or your solution design								

S.No.	Items	Unit	Qty (per location)	Unit Price	Total Price (Quarterly)	Compliant to ToR (Y/N)	If Non-Compliant - Specify the reason	Remarks
12	Operations & Maintenance Services as per TOR at Type-II Toll plazas (less than 16 toll lanes) (2PTZ + 2 fixed camera configuration)							
	Type-II Toll Plaza O&M (Quarterly)							
12.1	8 MBPS MPLS recurring charges	Monthly	3		0			
12.2	Manpower	Monthly	3		0			
12.3	Maintenance cost (AMC, Insurance, Interest, contingency etc.)	Monthly	3		0			
12.4	All applicable taxes	Monthly	3		0			
12.5					0			
12.6					0			
12.7					0			
	Total 12 (Type-II Toll Plaza O&M)					0		
Please add additional items in the blank rows above, if Any other item required as per the ToR or your solution design								

FORMAT FOR SUBMISSION OF PBG

Performance Bank Guarantee (PBG)

To,
The Chairman,
National Highways Authority of India
Plot Nos. G-5 & 6, Sector-10
Dwarka, New Delhi – 110075
India

WHEREAS M/s _____ [Name and address of Agency] (hereinafter called “the Service Provider”) has applied in pursuance to NHAI’s Notice Inviting Tender (NIT) against RFP No. dated for “Design, Supply Installation, Testing, Commissioning, Configuration, System Integration, Operations and Maintenance of Comprehensive System for Command and Control Centre including Video Conference, CCTV Surveillance & Monitoring of Vehicular Congestion on National Highway Toll Plazas” and has been adjudged successful bidder vide Letter of Award (LoA) No. dated and has been asked to sign a Contract Agreement in terms of the said RFP.

AND WHEREAS it has been stipulated by NHAI in the said letter that the Service Provider shall furnish a Bank Guarantee for the sum specified therein as security for compliance with his obligations in accordance with the terms & conditions of contract.

AND WHEREAS we have agreed to give the Service Provider such a Bank Guarantee:

NOW THEREOF we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Service Provider up to a total of ` ...../- (Rupees ..... ) only, such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of `/- as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

1. We hereby waive the necessity of your demanding the said debt from the Service Provider before presenting us with the demand.
2. We further agree that no change or addition to or other modification of the terms of the Service Provider or of the works to be performed thereunder or of any of the Contract documents which may be made between you and the Service Provider shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.
3. We undertake to pay to the NHAI any money so demanded notwithstanding any dispute or disputes raised by the Service Provider(s) in any suit or proceedings pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Service Provider(s) shall have no claim against us for making such payment.
4. The liability of the Bank under this Guarantee shall not be affected by any change in the constitution of the Service Provider or of the Bank.
5. This guarantee shall also be operatable at our _____ branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension/ renewal thereof

shall be made available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

6. This bank guarantee shall be valid from

7. Notwithstanding anything contained herein:

- (i) Our liability under this Bank Guarantee shall not exceed/-
- (ii) The Bank Guarantee shall be valid up to.....
- (iii) We are liable to pay the Guarantee amount or any part thereof under this Guarantee only and only if you serve upon us a written claim or demand on or before

Date :

Name:

Designation:

Employee Code Number:

Telephone Number:

Name of issuing bank branch _____

Address _____

Telephone number _____

E-mail: _____

Name of controlling bank branch _____

Address _____

Telephone number _____

E-mail: _____

Name of bank branch at New Delhi _____

Address _____

Telephone number _____

E-mail: _____



PART-IV

DRAFT FORM OF CONTRACT AGREEMENT

DRAFT CONTRACT AGREEMENT

No.

This Contract Agreement (hereinafter called the “Contract”) is made on this ____ day of the month of _____, 2017.

BETWEEN

National Highways Authority of India (NHAI), constituted by an Act of Parliament, The National Highways Authority of India Act, 1988, and having its head office at G 5 & 6, Sector 10, Dwarka, New Delhi-110075 (hereinafter referred to as the “NHAI”, which expression shall, unless repugnant to or inconsistent with the context, mean and include its successors and assigns) of the first part.

AND

M/s _____, a company incorporated under the provisions of the Companies Act, 1956 and having its registered office at _____ (for and on behalf of Consortium comprising _____ and (collectively the “Consortium”) with _____ as its lead member (the “Lead Member”)) (hereinafter referred to as the “Service Provider” which expression shall unless repugnant to or inconsistent with the context, mean and include its successors and assigns) of the OTHER PART.

WHEREAS

- (a) the Service Provider, in the ordinary course of its business, is engaged in providing similar services to their clients, and have represented to NHAI through their bids, against RFP for Command and Control Centre including Video Conference, CCTV Surveillance & Monitoring of Vehicular Congestion on National Highway Toll Plazas, RFP No. NHAI/13051/01/2017-IT (Revised) dated 21/06/2017 on above subject. (hereinafter called the “Tender”) for “*Design, Supply Installation, Testing, Commissioning, Configuration, System Integration, Operations and Maintenance of Comprehensive System for Command and Control Centre including Video Conference, CCTV Surveillance & Monitoring of Vehicular Congestion on National Highway Toll Plazas*” that they have the required professional skills, personnel and technical resources to provide the required Services;
- (b) on the basis of the said Tender, NHAI has adjudged the Service Provider as a Successful Bidder and issued Letter of Award (LoA) No. _____ dated _____.2017 for the same;
- (c) the Service Provider has agreed through their letter of acceptance No. _____ dated _____ to provide the said Services on the terms and conditions set forth in this Contract Agreement and has also submitted performance bank guarantee equivalent to _____ (Rs. _____) such that it remains valid until one year beyond completion of the contract.

NOW THEREFORE, in consideration of the foregoing and the respective covenants and agreements set forth in this Contract Agreement, the receipt and sufficiency of which is hereby acknowledged, and intending to be legally bound hereby, the Parties hereby agree as follows:

1. The mutual rights and obligations of the Service Provider and NHAI shall be as set forth in this Contract Agreement, in particular:

- (a) The Service Provider shall carry out the Services in accordance with the provisions of the Contract; and
- (b) NHAI shall make payments to the Service Provider in accordance with the provisions of the Contract.
2. The following schedules/ appendices shall be deemed to form and be read and construed as part of this Contract Agreement viz.

- (a) Schedule A: Conditions of Contract
- (b) Schedule B: Terms of Reference
- (c) Schedule C: Annuity Payment Schedule
- (d) Appendices:
- Appendix A Copy of Financial Bid of the Service Provider
- Appendix B Letter of Award issued by NHAI.
- Appendix C Letter of Acceptance submitted by the Service Provider
- Appendix D Copy of the Performance Security submitted by the Service Provider including copies of confirmation provided by the respective bank.
- Appendix E Copy of the Technical Bid and/or any subsequent correspondence of the Service Provider/ NHAI
- Appendix F Copy of RFP Document and subsequent amendment / addendum including Minutes of Pre-bid Meeting, if any

IN WITNESS WHEREOF, the parties hereto have caused this Contract Agreement to be executed by their respective authorized representatives on the day and year first before written.

FOR AND ON BEHALF OF
(National Highways Authority of India)
(Authorized Representative)
Name : _____
Designation _____
National Highways Authority of India
G-5&6, Sector – 10, Dwarka
New Delhi – 110075

FOR AND ON BEHALF OF
(M/s _____)
(Authorized Representative)
Name : _____
Designation : _____
M/s _____
Address : _____

In the presence of following witnesses:

Name : _____
Designation _____
National Highways Authority of India
G-5&6, Sector – 10, Dwarka
New Delhi – 110075

Name : _____
Designation : _____
M/s _____
Address : _____

Name : _____
Designation _____
National Highways Authority of India
G-5&6, Sector – 10, Dwarka
New Delhi – 110075

Name : _____
Designation : _____
M/s _____
Address : _____

DEFINITIONS AND INTERPRETATIONS

1.1 Definition

The words and expressions beginning with capital letters and defined in this Contract Agreement shall, unless the context otherwise requires, have the meaning ascribed thereto herein and the words and expressions defined in the Schedules and used therein shall have the meaning ascribed thereto in the Schedules annexed hereto. Words used in capitals and not defined herein but defined in the RFP shall have the meaning as ascribed thereto in the RFP.

1.2 Interpretation

1.2.1 In this Contract Agreement, unless the context otherwise requires,

- a) references to any legislation or any provision thereof shall include amendment or re-enactment or consolidation of such legislation or any provision thereof so far as such amendment or re-enactment or consolidation applies or is capable of applying to any transaction entered into hereunder;
- b) references to laws of India or Indian law or regulation having the force of law shall include the laws, acts, ordinances, rules, regulations, bye laws or notifications which have the force of law in the territory of India and as from time to time may be amended, modified, supplemented, extended or re-enacted;
- c) references to a “**person**” and words denoting a natural person shall be construed as a reference to any individual, firm, company, corporation, society, trust, government, state or agency of a state or any association or partnership (whether or not having separate legal personality) of two or more of the above and shall include successors and assigns;
- d) the table of contents, headings or sub-headings in this Contract Agreement are for convenience of reference only and shall not be used in, and shall not affect, the construction or interpretation of this Contract Agreement;
- e) the words “**include**” and “**including**” are to be construed, without limitation and shall be deemed to be followed by “**without limitation**” or “**but not limited to**” whether or not they are followed by such phrases;
- f) any reference to any period of time shall mean a reference to that according to Indian Standard Time;
- g) any reference to day shall mean a reference to a calendar day;
- h) references to a “**business day**” shall be construed as a reference to a day (other than a Sunday and holidays) on which banks in their respective States are generally open for business;
- i) any reference to month shall mean a reference to a calendar month as per the Gregorian calendar;
- j) references to any date, period or time shall mean and include such date, period or time as may be extended pursuant to this Contract Agreement;

- k) any reference to any period commencing “**from**” a specified day or date and “**till**” or “**until**” a specified day or date shall include both such days or dates; provided that if the last day of any period computed under this Contract Agreement is not a business day, then the period shall run until the end of the next business day;
- l) the words importing singular shall include plural and vice versa;
- m) “**lakh**” means a hundred thousand (100,000) and “**crore**” means ten million (10,000,000);
- n) references to the “**winding-up**”, “**dissolution**”, “**insolvency**”, or “**reorganization**” of a company or corporation shall be construed so as to include any equivalent or analogous proceedings under the law of the jurisdiction in which such company or corporation is incorporated or any jurisdiction in which such company or corporation carries on business including the seeking of liquidation, winding-up, reorganization, dissolution, arrangement, protection or relief of debtors;
- o) save and except as otherwise provided in this Contract Agreement, any reference at any time to any agreement, deed, instrument, license or document of any description shall be construed as reference to that agreement, deed, instrument, license or other document as amended, varied, supplemented, modified or suspended at the time of such reference; provided that this Sub-clause shall not operate so as to increase liabilities or obligations of NHAI hereunder or pursuant hereto in any manner whatsoever;
- p) any agreement, consent, approval, authorization, notice, communication, information or report required under or pursuant to this Contract Agreement from or by any Party shall be valid and effective only if it is in writing under the hand of a duly authorized representative of such Party, as the case may be, in this behalf and not otherwise;
- q) the Schedules and Recitals to this Contract Agreement form an integral part of this Contract Agreement and will be in full force and effect as though they were expressly set out in the body of this Contract Agreement;
- r) references to Recitals, Articles, Clauses, Sub-clauses or Schedules in this Contract Agreement shall, except where the context otherwise requires, mean references to Recitals, Articles, Clauses, Sub-clauses and Schedules of or to this Contract Agreement and references to a Paragraph shall, subject to any contrary indication, be construed as a reference to a Paragraph of this Contract Agreement or of the Schedule in which such reference appears; and
- s) the damages payable as set forth in this Contract Agreement, whether on per diem basis or otherwise, are mutually agreed genuine pre-estimated loss and damage likely to be suffered and incurred by the Party entitled to receive the same and are not by way of penalty (the “**Damages**”);
- t) “**Arbitration Act**” means the Arbitration and Conciliation Act, 1996 and shall include modifications to or any re-enactment thereof as in force from time to time;
- u) “**SYSTEM**” means “CCTV Surveillance, Video Conference & Monitoring of Vehicular

Congestion on National Highway Toll Plaza”

v) “Effective Date” shall mean date of this Contract Agreement;

1.2.2 Any word or expression used in this Contract Agreement shall, unless otherwise defined or construed in this Contract Agreement, bear its ordinary English meaning and, for these purposes, the General Clauses Act 1897 shall not apply.

1.3 Arithmetic conventions

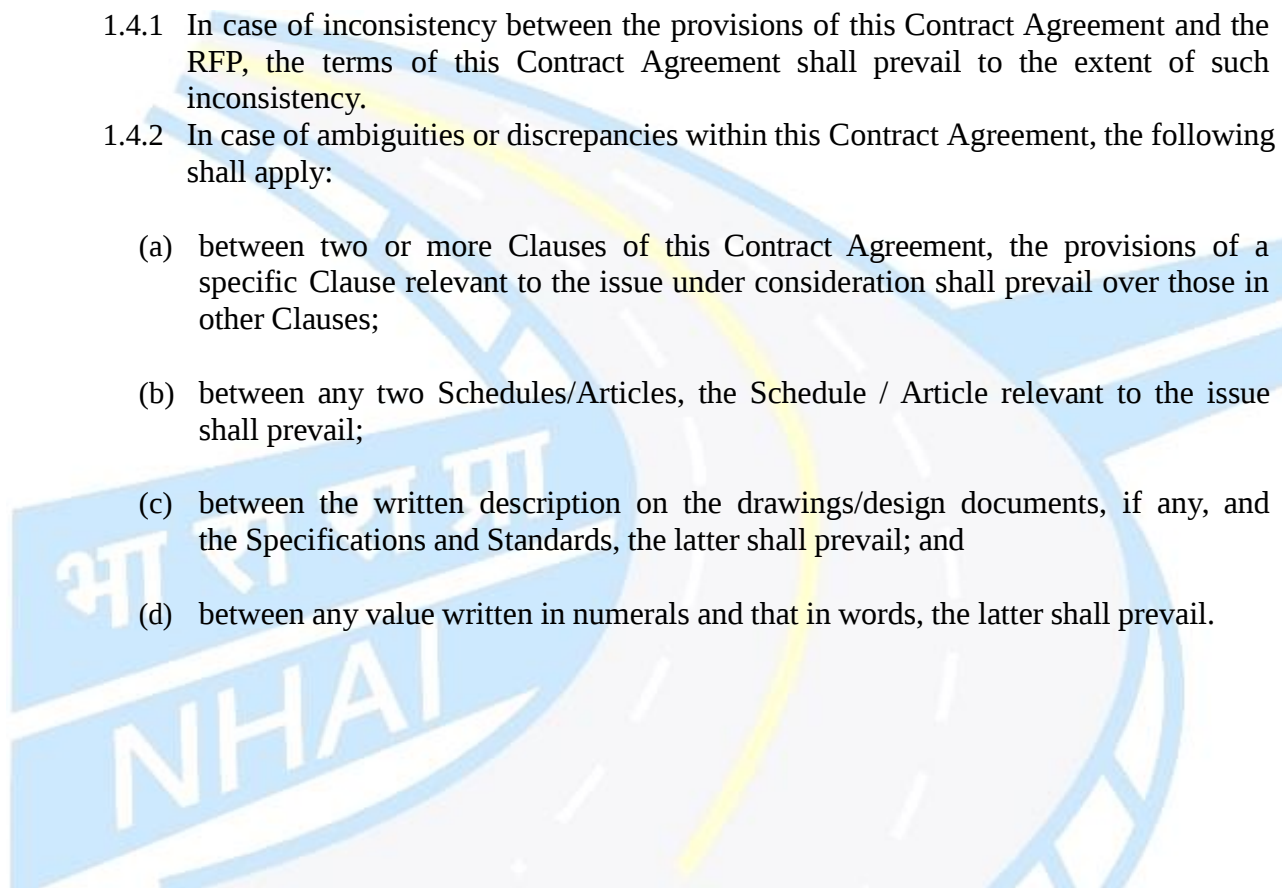
All calculations shall be done to 2 (two) decimal places, with the third digit of 5 (five) or above being rounded up and below 5 (five) being rounded down.

1.4 Priority of Agreements, Clauses and Schedules

1.4.1 In case of inconsistency between the provisions of this Contract Agreement and the RFP, the terms of this Contract Agreement shall prevail to the extent of such inconsistency.

1.4.2 In case of ambiguities or discrepancies within this Contract Agreement, the following shall apply:

- (a) between two or more Clauses of this Contract Agreement, the provisions of a specific Clause relevant to the issue under consideration shall prevail over those in other Clauses;
- (b) between any two Schedules/Articles, the Schedule / Article relevant to the issue shall prevail;
- (c) between the written description on the drawings/design documents, if any, and the Specifications and Standards, the latter shall prevail; and
- (d) between any value written in numerals and that in words, the latter shall prevail.



CONDITIONS OF CONTRACT**1. Scope of Work**

The Service Provider shall perform the services specified in Terms of Reference at Schedule-B, of this Contract Agreement.

2. Relationship between the Parties

Nothing contained herein shall be construed as establishing a relationship of master and servant or of principal and agent as between NHAI and the Service Provider. The Service Provider, subject to this Contract Agreement, has complete charge of Personnel performing the Services and shall be fully responsible for the Services performed by them or on their behalf hereunder. Service Provider shall alone be responsible for the remuneration and statutory compliance with respect to its employees, contractors or representatives. NHAI has no liability w.r.t. the representatives/ employees of the Service Provider. Service Provider will keep NHAI fully indemnified in this regard.

3. Governing Law and Jurisdiction

This Contract Agreement shall be construed and interpreted in accordance with and governed by the laws of India, and the courts at Delhi shall have exclusive jurisdiction over matters arising out of or relating to this Contract Agreement.

4. Language

This Contract Agreement has been executed in English, which shall be the binding and controlling language for all matters relating to the meaning or interpretation of this Contract Agreement.

5. Effectiveness of Contract

This Contract Agreement shall come into effect on the date the Contract is signed by both the Parties. The date, the Contract comes into effect is defined as the Effective Date.

6. Commencement of Services

The Service Provider shall commence the Services to NHAI as per the Schedule-B of this Contract Agreement.

7. Expiration of Contract

- (a) The term of this Contract Agreement shall be for a period of 6 (six) years with effect from Effective Date, with the initial one year as the implementation period (which will be executed in 3 phases as detailed in clause 11 below) and the balance period starting from immediately succeeding the completion of each phase and upto the end of the term of this Contract Agreement as operation and maintenance period. Any additional implementation work awarded during this 6 years period shall be adjusted as implementation and O& M in such a manner that the said period does not exceed beyond the initial six years or additional extended period thereof, if approved by NHAI, as the case may be.
- (b) The Agreement Period may be further extended for a period of another two years on the existing terms and conditions subject to satisfactory performance and continued requirement of NHAI at its sole discretion.

8. Assignment

This Contract Agreement shall not be assigned by the Service Provider to any person / agency save and except with the prior consent in writing of NHAI and NHAI shall be entitled to decline without assigning any reason whatsoever.

Notwithstanding anything to the contrary contained in this Contract Agreement, NHAI may, after giving 30 days' notice to the Service Provider, assign and/ or transfer any of its rights and benefits and/or obligations under this Contract Agreement to an assignee who is, in the reasonable opinion of NHAI, capable of fulfilling all of the NHAI's then outstanding obligations under this Contract Agreement.

9. Severability

If for any reason whatsoever any provision of this Contract Agreement is or becomes invalid, illegal or unenforceable or is declared by any court of competent jurisdiction or any other instrumentality to be invalid, illegal or unenforceable, the validity, legality or enforceability of the remaining provisions shall not be affected in any manner, and the Parties will negotiate in good faith with a view to agreeing to one or more provisions which may be substituted for such invalid, unenforceable or illegal provisions, as nearly as is practicable to such invalid, illegal or unenforceable provision. Failure to agree upon any such provisions shall not be subject to the Dispute Resolution Procedure set forth under this Contract Agreement or otherwise.

10. Notices

Any notice, request or consent required or permitted to be given or made pursuant to this Contract Agreement shall be in writing. Any such notice, request or consent shall be deemed to have been given or made when delivered in person to an authorized representative of the Party to whom the communication is addressed, or when sent to such Party at the address specified below. The mode of service of any notice shall be either courier or registered post or e-mail or fax or by hand.

The addresses for service of Notice shall be:

NHAI: General Manager (Electronics)

Attention: Deepak Saxena

Address: National Highways Authority of India,
G-5&6, Sector-10, Dwarka,
New Delhi - 110075

E-mail: deepaksaxena@nhai.org

Service Provider:

Attention:

Address:

E-mail:.....

11. Project Milestones including corresponding payment

Timeline will start with effect from the date of issue of the Letter of Award. The services shall be provided for a period of 6 years w.e.f. the date of completion of Phase-I.

Phase	Deliverables / Milestone	Cumulative Timeline in Days (from Effective Date)	Corresponding LS eligible payment	Approx. period of Operation and Maintenance under each phase after SAT
Phase-I	Design Review and Approval	30	NA	NA
	Entire services as per ToR including SAT at a) HQ Control and Command Center and; b) 4 RO control centre Chandigarh, Bengaluru, Jaipur and Gandhinagar; c) Any 20 Toll Plazas under jurisdiction of these ROs	120	30% of the quoted CAPEX in the financial bid against each respective CC Units covered under this Phase.	5 Y: 08 M
<i>1st Mid-Course Review (MCR-I)</i>	Mid-course review of project followed by mid-course corrections required (if any)	135	NA	NA
Phase-II	Entire services as per ToR including SAT at a) 8 RO (as per the selection of NHAI) b) Any 100 Toll Plazas under jurisdiction of these 8 ROs (as per the selection of NHAI)	235	30% of the quoted CAPEX in the financial bid against each respective CC Units covered under this Phase.	5 Y: 04 M
<i>2nd Mid-Course Review (MCR-II)</i>	Mid-course review of project followed by mid-course corrections required (if any)	245	NA	NA
Phase-III	Entire services as per ToR including SAT at a) 10 ROs (as per the selection of NHAI) b) Balance Toll Plazas	365	30% of the quoted CAPEX in the financial bid against each respective CC Units covered under this Phase.	5 Y: 0 M

12. Payment Terms

- a) Initial payment of 30% of the quoted CAPEX, in the financial bid submitted, against each respective CC Units covered under respective Phase shall be made by NHAI to the Service provider only after the system commissioning and achieving project milestone of each of such Phase upon completion of the Site Acceptance Tests and System Integration Test (of the entire system of respective Phase under consideration as mentioned in the project milestone above) to the satisfaction of NHAI.

- b) Operation and Maintenance period of each phase shall start immediately after the system commissioning and achieving project milestone of such Phase. In order to meet the operation and maintenance expenses during the implementation period but after the successful commissioning of Phase – I and Phase – II, respectively, to the satisfaction of NHAI, NHAI will pay to the Service Provider an amount equivalent to quoted OPEX in the financial bid for the CC units commissioned under respective phases. Such payments will be payable in arrears for each completed calendar quarter immediately succeeding the completion of respective phase upto the scheduled completion of all the implementation phases mentioned above, subject to deductions of penalties on account of:
- (i) Delayed system commissioning and thus a delayed start of commercial operations of the system in respective Phase;
 - (ii) Inability to meet Service level requirements in system operation in respective Phase;
 - (iii) Inability to meet service level requirements in system maintenance w.r.t. respective Phase.

Payments for periods falling short of a complete calendar quarter shall be paid proportionately as calculated on per diem basis;

- c) After successful commissioning of all phases mentioned above, Authority's Engineer in consultation with the Authority will issue a Commissioning Certificate of the Project to the Service Provider.

Quarterly Annuity instalments to the Service Provider shall start only after issuance of Commissioning Certificate of the Project by the Authority's Engineer as per terms of this Contract Agreement.

- d) During O & M period, The Service Provider shall submit the system generated attendance record of each employee deployed at the locations with each service invoice. The Authority's Engineer shall have the access to the logs of biometric attendance management system for verification of the actual manpower working days in a month / quarter. The amount against manpower will be payable only for the duration the O & M personnel will be available at site. In case the required manpower is not available at any location for more than 15 days in a month, no payment shall be made against manpower (as quoted in the financial bid) for that location for whole month, apart from other deductions / penalties as applicable.
- e) Payment after commissioning of Complete Project i.e. completion of all phases mentioned above to the satisfaction of NHAI: 10% of the quoted CAPEX in the financial bid shall be assumed to be the residual value of the Project after the end of the expiry of the original Contract. Therefore, the summation of balance 60% of the quoted CAPEX plus 20 times of quoted OPEX, in the financial bid submitted, against each respective CC Units covered under all the Phases shall be payable by NHAI to the Service Provider in 20 equal quarterly annuity payments.
- f) Subject to the provision of this Contract Agreement, Authority agrees and undertakes to pay to the Service Provider, for each Annuity Payment Period, on each Annuity Payment Date, the sum as determined by the Authority's Engineer based on the provisions of this Contract Agreement, financial bid quoted by the Service Provider in its Bid and the actual commissioning of the CC units by the Service Provider as certified by Authority's Engineer in the Commissioning Certificate of the Project. The amount of quarterly payable Annuity shall be mentioned in the format of Schedule C (Annuity Payment

Schedule) as prescribed in this Contract Agreement, which shall form part of the Commissioning Certificate of the Project issued by the Authority's Engineer.

- g) The first Annuity Payment shall be due and payable at the end of the calendar quarter immediately succeeding the date of Commissioning Certificate of the Project issued by NHAI. In case the date of Commissioning Certificate of the Project falls within a calendar quarter, first Annuity Payment shall be made proportionately as calculated on per diem basis at the end of such calendar quarter. Thereafter each subsequent Annuity Payment Period shall be deemed to be a period of 3 (three) calendar months from the immediately preceding Annuity Payment Date and so on upto the expiry of the term of this Contract Agreement.

Note: Payments for period falling short of a complete calendar quarter shall be paid proportionately as calculated on per diem basis at the time of expiry of term or termination of this Contract Agreement, as the case may be;

- h) Notwithstanding anything contrary contained to anywhere in this Contract Agreement, NHAI's obligation to pay Annuity shall arise subject to and only upon issuance of Commissioning Certificate of the Project by Authority's Engineer appointed by NHAI.

- i) The Service Provider will be paid on quarterly basis a lump sum amount in arrears in the form of Annuity towards the services made available to NHAI. Each quarterly payable annuity amount shall be based on actual (i) number of Toll plazas covered, (ii) number of Regional offices covered and (iii) Command & Control Centre at NHAI HQ, as applicable subject to deductions of penalties on account of:

- (i) Delayed system commissioning and thus a delayed start of commercial operations of the system:
- (ii) Inability to meet Service level requirements in system operation
- (iii) Inability to meet service level requirements in system maintenance

- j) Number of Toll Plazas and Regional offices covered may undergo changes during the term of this Contract Agreement.

(i) Increase in Toll Plazas and/or Regional Offices:

- If such increase occurs during the implementation phase i.e. during phase-I/II/III but atleast 90 days prior to the end of Phase-III, then subject to other terms of this Contract Agreement, payment shall be made in accordance with 12(a) and (d) above.
- If such increase occurs within 90 days prior to end of Phase-III or after the implementation phase i.e. during the operation and maintenance of the Project but at least 2 years prior to the expiry of this Contract Agreement, then payment shall be made to the Service Provider as per following methodology:
 - payment of 30% of the quoted CAPEX in the financial bid against such additional CC Units shall be made by NHAI to the Service provider only after successful commissioning of such CC unit to the satisfaction of NHAI subject to conditions mentioned in 12 (a) above.
 - After that the annuity payable amount shall be increased by an amount calculated taking into consideration the remaining number of quarters upto the expiry of term of this Contract Agreement by using the formula as {60% of quoted CAPEX of such CC Unit + (quoted OPEX multiplied by remaining quarters)}/ remaining quarters.

For illustration:

Let us assume, the NHAI ask the Service Provider to add 2 ROs of Type-1 and 10 Toll Plaza of Type-1 are added after the 3.5 years from the Effective Date (i.e. Date of Signing of this Contract Agreement). The Annuity will be calculated as under:

- (a) Quoted CAPEX in the financial bid of RO Type-1 say 'CR1'
- (b) Quoted CAPEX in the financial bid of TP Type-1 say 'CT1'
- (c) Quoted OPEX in the financial bid of RO Type-1 say 'OR1'; and
- (d) Quoted OPEX in the financial bid of TP Type-1 say 'OT1'
- (e) The aforesaid work is commissioned within 90 days of issue of work order.
- (f) Thus, remaining quarters upto the expiry of the Contract from the date of commissioning of aforesaid work is $20 - 10 - 1 = 9$ Quarters

In view of the above, the Service Provider shall be paid as follows:

- Initial payment of 30% of the quoted CAPEX i.e. 30% of $(2*CR1 + 10*CT1)$;
- After that the Annuity amount shall be increased by:
 $\{[60\% \text{ of } (2*CR1 + 10*CT1)] + [(2*OR1 + 10*OT1)*9]\} / 9$

(ii) Reduction in Toll Plazas and/or Regional Offices:

- If such reduction occurs before commissioning of such CC unit, then no payment shall be made w.r.t. such CC unit whether as initial payment or in the form of annuity. The payment shall be made to the Service Provider as per the number of CC units actually commissioned.
 - If such reduction occurs after commissioning of such CC unit i.e. during the operation and maintenance of such CC unit, then the Service Provider shall be entitled to get the compensation towards loss suffered for the remaining un-serviced period of the original Contract @ 0.5% of the CAPEX quoted in the financial bid for such CC unit multiplied by number of quarters remaining upto the expiry of Original Contract period. Service Provider acknowledges that the said compensation shall be a reasonable estimation of loss suffered due to such reduction. Pursuant to payment of such compensation, the Service Provider shall have no further claim whatsoever against the NHAI w.r.t. such reduction.
- k) The Toll Plazas and Regional offices may also undergo physical shifting. The service provider may be asked by NHAI to relocate the equipment and/or other items installed at such CC units and provide services accordingly. In such cases, Service Provider shall be entitled to receive the compensation as determined by the Authority's Engineer. In the assessment of compensation the Authority's Engineer shall take into account loss suffered by the Service Provider in dismantling/ relocation of equipments/ items installed at such CC unit and any payments already received by the Service Provider, if any.
- l) Any increase of the CC Unit(s) after the expiry of 4 years from the Effective Date shall only be asked to the Service Provider, in case NHAI decides to extend the term of this

Contract Agreement as contemplated in clause 7(b) of this Contract Agreement. In case of such increase, the increase in the payments to the Service Provider w.r.t. such increased CC unit(s) shall be governed in the following manners:

- payment of 30% of the quoted CAPEX in the financial bid against such additional CC Units shall be made by NHAI to the Service provider only after successful commissioning of such CC unit to the satisfaction of NHAI subject to conditions mentioned in 12 (a) above.
- After that the annuity payable amount shall be increased by an amount calculated taking into consideration the remaining number of quarters upto the expiry of term of this Contract Agreement considering the extension provided by NHAI by using the formula as {60% of quoted CAPEX of such CC Unit + (quoted OPEX* multiplied by remaining quarters)}/ remaining quarters.

For illustration:

Let us assume, the NHAI ask the Service Provider to add 1 ROs of Type-1 and 5 Toll Plaza of Type-1 are added after the 4.5 years from the Effective Date (i.e. Date of Signing of this Contract Agreement) and extended the term of the Contract for 2 years as contemplated in clause 7(b) of this Contract Agreement. The Annuity will be calculated as under:

- (a) Quoted CAPEX in the financial bid of RO Type-1 say 'CR1'
- (b) Quoted CAPEX in the financial bid of TP Type-1 say 'CT1'
- (c) Quoted OPEX in the financial bid of RO Type-1 say 'OR1'; and
- (d) Quoted OPEX in the financial bid of TP Type-1 say 'OT1'
- (e) The aforesaid work is commissioned within 90 days of issue of work order.
- (f) Thus, remaining quarters upto the expiry of the Contract taking into consideration the extension of 2 years provided by NHAI from the date of commissioning of aforesaid work is $28 - 14 - 1 = 13$ Quarters

In view of the above, the Service Provider shall be paid as follows:

- Initial payment of 30% of the quoted CAPEX i.e. 30% of $(1*CR1 + 5*CT1)$;
- After that the Annuity amount shall be increased by:
 $\{[60\% \text{ of } (1*CR1 + 5*CT1)] + [(1*OR1 + 5*OT1)*13]\}/13$

However, the annuity payable for the CAPEX portion quoted for existing CC units already commissioned shall automatically stop after the expiry of original term of this Contract Agreement and only the annuity payment towards quoted OPEX for the existing CC units shall only be paid by NHAI to Service Provider during the extended period of the Contract.

*Note: The quoted CAPEX and OPEX for each category of CC Units in the financial bid shall remain unchanged for entire term of original Contract Period. However in case of extension pursuant to clause 7(b) of this Contract Agreement, the OPEX payable to the Service Provider during the first year of the extended period in the form of Annuity, shall be revised to reflect the change in Wholesale Price Index (WPI) between the quarter

ending on immediately preceding the end of the original term of this Contract Agreement and the quarter ending on 1 year prior to the quarter ending on immediately preceding the end of original term of this Contract Agreement.

Similarly, the quoted OPEX payable in the second year after expiry of original term of this Contract Agreement shall also be revised to reflect the change between the quarter ending on immediately preceding the end of the 1 year after end original term of the this Contract Agreement and the quarter ending on immediately preceding the end of original term of this Contract Agreement.

For illustration, Let us assume, the expiry of original term of this Contract Agreement is 15th December 2023 and NHAI decides to extend the term upto 15th December 2025. In such case, then Quoted OPEX payable during the first year and second year of extension i.e. during the period from 16th December 2023 to 15th December 2024 and 16th December 2024 to 15th December 2025 respectively shall be calculated as follows:

For First Year:

Say WPI as on 30.09.2023 = W_1

WPI as on 30.09.2022 = W_0

Quoted OPEX = 'OP'

In that case, the quoted OPEX shall be revised for First Year as $OP * [(W_1 - W_0) / W_0]$.

For Second Year:

Say WPI as on 30.09.2024 = W_1

WPI as on 30.09.2023 = W_0

Quoted OPEX = 'OP'

In that case, the quoted OPEX shall be revised for Second Year as $OP * [(W_1 - W_0) / W_0]$.

- m) NHAI will allow 30 days' time (w.e.f. the date of allocation of new site free from encumbrances) to relocate services under such cases and in case of any delay thereafter on part of Service Provider, liquidated damages @ 120% of per day per CC unit cost shall be applicable subject to a maximum of 10% of quarterly payable amount for that CC unit. Once the maximum is reached, NHAI shall issue warning/ issue a notice in terms of clause 22 of this Contract Agreement to the Service Provider and dealt in accordance with the terms of this Contract Agreement.
- n) The Concessionaire shall submit its invoice for Annuity payment after the end of the quarter, addressed to the Authority for payment of Annuity for the applicable Annuity Payment Period with a copy to Authority's Engineer.
- o) The above payment shall be made in Indian Rupees within 30 days of receipt of the invoice by NHAI and /or Authority's Engineer. The Service Provider's performance and monthly reports related to the submitted invoice will be evaluated by NHAI or Authority's Engineer before certifying the same for payment. In case any clarifications / checks etc. is required for payment processing and if it is likely to take some time, NHAI may release 80% of the invoice amount within 30 days of receipt of the same and the balance 20% shall be settled after completion of clarifications/ checks etc.
- p) The quoted rates for all items shall remain unchanged for entire Contract Period. In case there is increase or decrease in any item(s) to be installed on any CC unit requisitioned by NHAI, then the payments to the Service Provider shall get increased or decreased, as the

case may be, in reference to the quoted price in the financial bid and/or as assessed by the Authority's Engineer in case item is not mentioned in the financial bid.

- q) The quoted prices are inclusive of all Taxes & duties except Service tax / GST (as applicable on services), which shall be reimbursed separately on production of proof of payment and certificate from Chartered Accountant.
- r) NHAI is not liable to pay any amount (except the amount stated above) of any nature whatsoever. It is clarified that no amount toward cost or expenses incurred, of whatsoever nature, shall be payable separately for carrying out the services prior to or after the field work such as holding discussion, if any, as considered necessary by NHAI or otherwise, for any purpose at NHAI's Head office or elsewhere, prior, during and after the conduct of an assignment at site.
- s) Service Provider shall submit reports to NHAI as prescribed under Schedule B along with invoices.
- t) NHAI reserves an option, at its sole discretion, to buy back the entire system or any part of the system or any item, equipment, etc. installed by the Service Provider on the CC units at their residual value which shall be considered as 10% of the CAPEX quoted in the financial bid for such system, equipment, item, etc.

13. Project Administration

The NHAI designates *General Manager (Electronics)* at Head office of NHAI, as its coordinator, who will be responsible for the coordination of activities under this Contract Agreement, for acceptance and approval of the services and of other deliverables by NHAI and for receiving and approving invoices for the payment.

14. Fraud and Corruption

14.1 Definitions

It is NHAI's policy that NHAI as well as Service Providers observe the highest standard of ethics during the selection and execution of such contracts. In pursuance of this policy, NHAI defines, for the purpose of this provision, the terms set forth below as follows:

- (a) "corrupt practice" means the offering, receiving, or soliciting, directly or indirectly, of anything of value to influence the action of a public official in the selection process or in contract execution;
- (b) "fraudulent practice" means a misrepresentation or omission of facts in order to influence a procurement process or execution of a contract with NHAI; and includes collusive practice among bidders, prior to or after bid submission, designed to establish bid prices at artificially high or non-competitive levels and to deprive NHAI of the benefits of free and open competition;
- (c) "collusive practices" means a scheme or arrangement between two or more bidders, with or without the knowledge of NHAI, designed to establish prices at artificial, non-competitive levels;
- (d) "coercive practices" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in a procurement process, or affect the execution of a contract;
- (e) "unfair trade practices" means supply of services different from what is ordered on, or change in the Scope of Work which was not agreed to; and
- (f) "restrictive practices" means forming a cartel or arriving at any understanding or arrangement among bidder(s) with the objective of restricting or manipulating a full and fair competition in the bidding process.

14.2 Measures to be taken by NHAI

- (a) NHAI may terminate the contract if it determines at any time that representatives of the Service Provider were engaged in corrupt, fraudulent, collusive or coercive practices during the selection process or the execution of that contract, without the Service Provider having taken timely and appropriate action satisfactory to NHAI to remedy the situation;
- (b) NHAI may also sanction against the Service Provider, including blacklisting / declaring the Service Provider ineligible, either indefinitely or for a stated period of time, to be awarded a contract if it at any time determines that the Service Provider has, directly or through an agent, engaged in corrupt, fraudulent, collusive or coercive practices in competing for, or in executing, a contract with NHAI.

15. Confidentiality of the Assignment/Findings

The Service Provider shall not, during the term of this Contract Agreement and within three years after its expiration or termination, disclose or permit to be disclosed any proprietary or confidential information relating to the services, this Contract Agreement or the NHAI's business or operations without the prior written consent of NHAI to any third party other than its agents, consultants, or subcontractors who need to know in connection with the purpose for which it was disclosed and who are bound to preserve the confidentiality thereof, to any person outside its organization, any Proprietary Information.

The Service Provider and its personnel shall use such Proprietary Information only for the purpose for which it was disclosed and shall not use or exploit such Proprietary Information for its own benefit or the benefit of another without the prior written consent of the NHAI. Without limitation of the foregoing, Service Provider shall not cause or permit reverse engineering of any Proprietary Information or recompilation or disassembly of any information or software programs which are part of the Proprietary Information received by it under this Contract Agreement. For the purposes of this Contract Agreement Proprietary information shall include but not be limited to terms of this Contract Agreement, strategies, official secrets, actual and anticipated research, developments or plans, services, software, source codes, inventions, processes, discoveries, formulas, architectures, concepts, ideas, designs, drawings, personnel, financial information, demonstrations, operations, records, assets, technology, data and information derived whether existing or derived / analysed out of the information made available to the Service Provider in form of raw data or reports, in any form whatsoever.

The Service Provider alone shall be responsible to ensure the maintenance of confidentiality as contemplated above and shall be responsible to employ sufficient measures to prevent any unauthorised access of the Proprietary information.

16. Ownership of Equipment & other conditions

- (i) All the material and equipment under the project shall be owned by the Service Provider throughout the duration of contract.
- (ii) Procurement of any System or its subsystems/ Equipment/ Hardware/Software etc. has not been envisaged through this tender. The Service Provider shall be required to provide the services as per the scope of work prescribed herein.
- (iii) The Service Providers are advised to offer and propose the latest technologies/ cost effective/ innovative/ best suitable system and equipment for Traffic Scenario on National Highways and conditions at the project sections.
- (iv) Any studies report or other material, data or information otherwise prepared by the Service Provider for NHAI under the contract including all related database/ files /back up of images/ videos etc. shall belong to and remain the property of NHAI which will be handed over to NHAI in a condition that it can be made use of by it without having to procure any propriety software/ tool.

17. Insurance cover to be maintained

- (a) All the material and equipment shall be owned by the Service Provider throughout the duration of contract and the Service Provider shall ensure to maintain proper insurance coverage of its equipment against fire, theft, vandalism or any other perceived risk(s) / natural disaster etc.
- (b) In addition to material and equipment, the Service Provider shall also ensure to have adequate insurance for all its personal working/ deployed under this Contract Agreement.
- (c) The Service Provider shall indemnify NHAI against any damage/ loss of property or personnel of Service Provider working on any site under this Contract Agreement.

18. No partnership

This Contract Agreement shall not be interpreted or construed to create an association, joint venture or partnership between the Parties, or to impose any partnership obligation or liability upon either Party and neither Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as an agent or representative of, or to otherwise bind, the other Party.

19. Intellectual Property Rights

All Intellectual Property of the respective Parties shall continue to vest with the respective Party and one Party may make use of the Intellectual Property only with the express consent of the other Party. However it is agreed and acknowledged by the Service Provider that intellectual property rights in the Proprietary Information as well as any other data or information/ reports generated during the performance of services contemplated herein by the Service Provider shall always vest with NHAI and Service Provider will not have any right in such IPR whatsoever.

20. Force Majeure

Neither party shall in any event be liable for any failure to perform its obligations under this Contract Agreement due to any events beyond the reasonable control of either party or any events of force majeure.

No Party shall be considered in default of performance of its obligations under the terms of this Contract Agreement, if such performance is prevented or delayed for any causes beyond the reasonable control of the Party affected by such event (hereinafter referred to as “**Affected Party**”), including, but not limited to, fire, flood, explosion, acts of God, public disorder, riots, embargoes, or strikes, acts of military authority, epidemics, strikes, lockouts or other labour disputes, insurrections, civil commotion, war, enemy actions which substantially bars the performance of obligations of the Affected Party (hereinafter referred to as “**Force Majeure Event**”)

20.1 Reporting of Force Majeure

If a Force Majeure Event arises in the aforesaid manner, the Affected Party shall within maximum 24 hours notify the other Party in writing of such condition and the cause thereof. However, in case the Service Provider claims to have suffered a Force Majeure Event, the Service Provider shall continue to perform its obligations under this Contract Agreement as far as is reasonably practical, and shall seek all reasonable alternative means for performance, unless otherwise directed by NHAI.

20.2 Mitigate the Force Majeure Event

Upon occurrence of Force Majeure Event, the Affected Party shall immediately take steps as are reasonably necessary to remove the causes resulting in Force Majeure if within its control and to mitigate the effect thereof. Any costs incurred and

attributable to such event or curing of the Force Majeure Event shall be solely borne by the Affected Party.

21. Dispute Resolution

- (a) Any dispute or difference whatsoever arising between the parties and of or relating to the construction, interpretation, application, meaning, scope, operation or effect of this Contract Agreement or the validity or the breach thereof, shall be referred to the Society for Affordable Resolution of Disputes (SAROD) and the award made in pursuance thereof shall be final and binding on the parties subject to Provisions of The Arbitration and Conciliation Act, 1996.
- (b) This Contract Agreement shall be governed by, and construed in accordance with, the laws of India and courts at New Delhi shall have exclusive jurisdiction over all disputes arising under, pursuant to and/or in connection with this Contract Agreement.

22. Termination

- (a) Either party may terminate this Contract Agreement due to breach of terms agreed to in this Contract Agreement by the other party. However, the party aggrieved by the breach shall give written notice to the other party to this Contract Agreement indicating that the contract shall be terminated not earlier than 90 days from the date of the receipt of the notice.
- (b) NHAI, in its sole discretion and for any reason whatsoever, may terminate this Contract Agreement for dereliction in performance of stipulated duties by the Service Provider.
- (c) Notwithstanding anything stated in this Contract Agreement, in the event of any defaults on part of the Service Provider, NHAI shall issue a notice to the Service Provider (hereinafter referred to as Cure Period Notice). If the Service Provider fails to cure the default within the Cure Period, as stated in the Cure Period Notice, the Service Provider shall be deemed to be in default of this Contract Agreement, unless the default has occurred solely as due to Force Majeure or for reasons not attributable to the Service Provider. The Cure Period under this Clause shall be calculated from the date of receipt of the notice by the Service Provider or when the default comes into the knowledge of the Service Provider, whichever is earlier. If the Service Provider fails to remedy the default after lapse of cure period notice, NHAI may consider terminating the contract.
- (d) NHAI may also terminate this Contract Agreement if in its judgment the Service Provider has engaged in corrupt and fraudulent practice in competing for or in execution / implementation of the project.

23. Consequences of Expiry / Termination

- (a) Upon expiry / Termination, the Service Provider shall, without delay or demur, transfer all relevant documents / information/ software application developed under the contract / sources code / back up / data/ permissions to NHAI or any other entity as directed by it;
- (b) Upon expiry / Termination of Contract for any reason whatsoever, the Service Provider shall remove/ dismantle the hardware, equipments, and other items installed on CC units with an obligation to make good the premises of the CC units as was originally allocated subject to normal wear and tear as per prevalent industry practice.
- (c) Upon Termination (except on account of expiry of Term of this Contract Agreement or Force Majeure), NHAI shall be entitled to appropriate the Performance Security.

- (d) In case of Termination of the Project at the discretion of NHAI due to any reasons not attributable to the Service Provider, then the Service Provider shall be entitled to get the compensation towards loss suffered for the remaining un-serviced period of the Contract @ 0.5% of the CAPEX quoted in the financial bid multiplied by number of quarters remaining upto the expiry of Original Contract period. Service Provider acknowledges that the said compensation shall be a reasonable estimation of loss suffered due to such termination. Pursuant to payment of such compensation, the Service Provider shall have no further claim against the NHAI w.r.t. this Contract Agreement.

24. Survival of rights

Notwithstanding anything to the contrary contained in this Contract Agreement, any Termination pursuant to the provisions of this Contract Agreement shall be without prejudice to the accrued rights of either Party including its right to claim and recover money damages, security deposits, and other rights and remedies which it may have in law or contract.

25. Indemnification

- (a) The Service Provider shall indemnify, defend, save and hold harmless, NHAI and M/o Road Transport and Highways (M/o RT&H) and its Officers, Agents against any direct loss, damage, claims, cost and expense of whatever kind and nature (including without limitation, legal fees, claims and expenses incurred in connection with any suit, action or proceeding or any claim asserted, such as fees and expenses incurred), joint or several, that arise out of or are based upon any order passed by any statutory authority including courts, tribunals or other judicial/ quasi – judicial authorities, on account of breach of the Service Provider's obligations under this Contract Agreement or any other related agreement or otherwise, any fraud or negligence attributable to the Service Provider or its Agents or Sub-Service Providers, under contract or tort or on any other ground whatsoever, all eventualities of theft, dacoity, robbery, etc., except to the extent that any such suits, proceedings, actions, demands and claims has arisen due to any breach or default of this Contract Agreement on the part of NHAI.
- (b) The Service Provider shall indemnify NHAI and M/o RTH of all legal obligations of its professionals deployed. NHAI and M/o RTH also stand absolved of any liability on account of death or injury sustained by the Service Provider's staff during the performance of their work and also for any damages or compensation due to any dispute between the Service Provider and its staff.
- (c) The remedies provided under this Article are not exclusive and shall not limit any rights or remedies that may otherwise be available to NHAI Indemnified Party at law or in equity.
- (d) The provisions of this Article shall survive Termination.

26. Compensation for default by the Service Provider

- 28.1 In the event of the Service Provider being in breach of this Contract Agreement, unless such default or delay is on account of Force Majeure or through no fault of the Service Provider, the Service Provider shall pay to NHAI, all direct costs suffered or incurred by NHAI as a consequence of such breach, within 30 days of receipt of the demand supported by necessary particulars thereof.
- 28.2 The Service Provider shall pay to NHAI all direct costs suffered or incurred by NHAI incurred as a result of any and all losses, claims, damages and liabilities (including, without limitation, legal fees and other expenses incurred in connection with any suit,

action or proceeding or any claim asserted, such as fees and expenses incurred), joint or several, that arise out of, or based upon:

- (i) any untrue statement or misrepresentation of a material fact provided by the Service Provider or an omission to state a material fact required to be communicated;
- (ii) any non-performance or breach of the roles, responsibilities, representations, warranties, undertakings and declarations contained herein by the Service Provider or its directors, employees, personnel or representatives.
- (iii) negligence, fraud or misconduct of the Service Provider or any of its employees, agents, affiliates or advisors.

27. Cap on Liability of Parties

Notwithstanding anything stated herein above and under any circumstances, the liability of Service Provider under this Clause for each site shall not exceed the equivalent amount payable for four quarterly payments.

28. Survival

The provisions of this Article shall survive Termination.

29. Representation and warranties of the Service Provider

The Service Provider declares, represents, and warrants as follows:

- 29.1 It is duly organized and validly existing under the laws of India, and has full power and authority to execute and perform its obligations under this Contract Agreement and to carry out the works and provide services contemplated hereby;
- 29.2 It has taken all necessary corporate actions under Applicable Laws to authorize the execution and delivery of this Contract Agreement and to validly exercise its rights and perform its obligations under this Contract Agreement;
- 29.3 It has obtained all necessary internal/external approvals, registrations and certifications required from relevant authorities and other entities for fulfilling its obligations as set out in this Contract Agreement;
- 29.4 It has not violated any of the conditions subject to which such approvals, registrations and certifications have been granted or any other applicable regulations and / or guidelines or directives or statutes;
- 29.5 It shall ensure that such approvals, registrations and certifications will remain in force, including, by taking prompt steps for timely renewal of the same;
- 29.6 It undertakes to continue to comply with all Applicable Laws with respect to its roles / obligations under this Contract Agreement;
- 29.7 There are no actions, suits, proceedings, or investigations pending before any court or before any other judicial, quasi- judicial or other authority, the outcome of which may result in the breach of this Contract Agreement or which individually or in the aggregate may result in any material impairment of its ability to perform any of its obligations under this Contract Agreement;
- 29.8 It shall at no time sub-contract any of its obligations under this Contract Agreement without the prior permission from NHAI . NHAI. Provided that in case in case the

Service Provider proposes to sub-contract any of its obligations under this Contract Agreement, it shall seek written permission along with the details of the activities that it proposes to sub-contract to third parties;

29.9 No representation or warranty by the Service Provider contained herein or in any other document furnished by it to NHAI in relation to Applicable Laws contains or will contain any untrue or misleading statement of material fact or omits or will omit to state a material fact necessary to make such representation or warranty not misleading;

29.10 No sums, in cash or kind, have been paid or will be paid, by or on behalf of the Service Provider, to any person by way of fees, commission or otherwise for securing the award of this Contract Agreement or for entering into this Contract Agreement or for influencing or attempting to influence any officer or employee of NHAI in connection therewith.

30. Authority's Engineer

30.1 Appointment of the Authority's Engineer

NHAI shall appoint a consulting engineering firm, to be The Engineer for monitoring and supervision of the Project under this Contract Agreement (the "Authority's Engineer").

The Authority's Engineer should be appointed within 30 days of issuance of Letter of Award to the Service Provider. NHAI shall notify the appointment or replacement of the Authority's Engineer to the Service Provider.

The staff of the Authority's Engineer shall include suitably qualified engineers and other professionals who are competent to assist the Authority's Engineer to carry out its duties.

30.2 Duties and authority of the Authority's Engineer

The Authority's Engineer shall perform the duties and exercise the authority in accordance with the provisions of this Contract Agreement, and substantially in accordance with the terms of reference ("**Authority's Engineer Terms of Reference**" or "**AE's ToR**") set forth herein under, but subject to obtaining prior written approval of NHAI before determining:

- (a) any Time Extension;
- (b) any additional cost to be paid by NHAI to the Service Provider;
- (c) the Termination Payment; or
- (d) any other matter which is not specified in (a), (b) or (c) above and which creates an obligation or liability on either Party for a sum exceeding Rs. 50,00,000/- (Rs. fifty lakh).

No decision or communication of the Authority's Engineer shall be effective or valid unless it is accompanied by an attested true copy of the approval of NHAI for and in respect of any matter specified in Clause 30.2 (a) to (d).

The Authority's Engineer shall submit regular periodic reports, at least once every month, to NHAI in respect of its duties and functions under this Contract Agreement. Such reports shall be submitted by the Authority's Engineer within 10 (ten) days of the beginning of every month.

30.3 Delegation by the Authority's Engineer

- 30.3.1 The Authority's Engineer may, by order in writing, delegate any of his duties and responsibilities to suitably qualified and experienced personnel who are accountable to Authority's Engineer, or may revoke any such delegation, under intimation to NHAI and the Service Provider. Provided, however, that the Authority's Engineer shall be responsible and liable for all actions and omissions of such personnel.
- 30.3.2 Any failure of the Authority's Engineer to disapprove any work, or Materials shall not constitute approval, and shall therefore not prejudice the right of NHAI to reject the work or Materials, which is not in accordance with the provisions of this Contract Agreement and the Specifications and Standards.
- 30.3.3 Notwithstanding anything stated in Clause 30.3.1 above, the Authority's Engineer shall not delegate the authority to refer any matter for the Authority's prior approval wherever required in accordance with the provisions of Clause 30.2.

30.4 Instructions of the Authority's Engineer

- 30.4.1 The Authority's Engineer may issue to the Service Provider instructions for remedying any Defect. The Service Provider shall take such instructions from the Authority's Engineer, or from an assistant to whom appropriate authority has been delegated under Clause 30.3.
- 30.4.2 The instructions issued by the Authority's Engineer shall be in writing. However, if the Authority's Engineer issues any oral instructions to the Contractor, it shall confirm in writing the oral instructions within 2 (two) working days of issuing them.
- 30.4.3 In case the Contractor does not receive the confirmation of the oral instruction within the time specified in Clause 30.4.2, the Contractor shall seek the written confirmation of the oral instructions from the Authority's Engineer. The Contractor shall obtain acknowledgement from the Authority's Engineer of the communication seeking written confirmation. In case of failure of the Authority's Engineer or its delegated assistant to reply to the Contractor within 2 (two) days of the receipt of the communication from the Contractor, the Contractor may not carry out the instruction.
- 30.4.4 In case of any dispute on any of the instructions issued by the delegated assistant, the Contractor may refer the dispute to the Authority's Engineer, who shall then confirm, reverse or vary the instructions within [3 (three)] business days of the dispute being referred.

30.5 Determination by the Authority's Engineer

- 30.5.1 The Authority's Engineer shall consult with each Party in an endeavour to reach agreement wherever this Contract Agreement provides for the determination of any matter by the Authority's Engineer. If such agreement is not achieved, the Authority's Engineer shall make a fair determination in accordance with this Contract Agreement having due regard to all relevant circumstances. The Authority's Engineer shall give notice to both the Parties of each agreement or determination, with supporting particulars.
- 30.5.2 Each Party shall give effect to each agreement or determination made by the Authority's Engineer in accordance with the provisions of this Contract Agreement. Provided, however, that if any Party disputes any instruction, decision, direction or determination of the Authority's Engineer, the Dispute shall be resolved in accordance with the Dispute Resolution Procedure.

30.6 Remuneration of the Authority's Engineer

The remuneration, cost and expenses of the Authority's Engineer shall be paid by the Authority.

30.7 Termination of the Authority's Engineer

- 30.7.1 The Authority may, in its discretion, replace the Authority's Engineer at any time, but only after appointment of another Authority's Engineer in accordance with Clause 30.1.

31. Brief Terms of Reference of Authority's Engineer

31.1 Scope

- 31.1.1 These Terms of Reference (the "ToR") for the Authority's Engineer are being specified pursuant to the Agreement dated (the "Agreement"), which has been entered into between the [name and address of the Authority] (the "Authority") and (the "Service Provider") for [.....].
The ToR shall apply to entire life cycle of the subject project.

31.2 General

- 31.2.1 The Authority's Engineer shall discharge its duties in a fair, impartial and efficient manner, consistent with the highest standards of professional integrity and Good Industry Practice.
- 31.2.2 The Authority's Engineer shall perform the duties and exercise the authority in accordance with the provisions of this Contract Agreement, but subject to obtaining prior written approval of the Authority before determining:
- (a) any Time Extension;
 - (b) any additional cost to be paid by the Authority to the Contractor;
 - (c) the Termination Payment; or
 - (d) any other matter which is not specified in (a), (b) or (c) above and which creates an obligation or liability on either Party for a sum exceeding Rs. 5,000,000 (Rs. fifty lakh).
- 31.2.3 The Authority's Engineer shall submit regular periodic reports, at least once every month, to the Authority in respect of its duties and functions under this Contract Agreement. Such reports shall be submitted by the Authority's Engineer within 10 (ten) days of the beginning of every month.
- 31.2.4 The Authority's Engineer shall inform the Contractor of any delegation of its duties and responsibilities to its suitably qualified and experienced personnel; provided, however, that it shall not delegate the authority to refer any matter for the Authority's prior approval in accordance with the provisions of Clause 30.2.
- 31.2.5 The Authority's Engineer shall aid and advise the Authority on any proposal for Change of Scope (as applicable).
- 31.2.6 In the event of any disagreement between the Parties regarding the meaning, scope and nature of Good Industry Practice, as set forth in any provision of the Agreement, the Authority's Engineer shall specify such meaning, scope and nature by issuing a reasoned written statement relying on good industry practice and authentic literature.

31.3 Implementation Period

- 31.3.1 During the Implementation Period, the Authority's Engineer shall review the Design Document and Drawings furnished by the Contractor along with all supporting data. The Authority's Engineer shall complete such review and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt. In particular, such comments shall specify the conformity or otherwise of proposed system / solution design / architecture with the Scope of the Project, Specifications and Standards prescribed in ToR.

- 31.3.2 The Authority's Engineer shall review any revised document sent to it by the Contractor and furnish its comments within 10 (ten) days of receiving such Documentation.
- 31.3.3 The Authority's Engineer shall review the Quality Assurance Plan and Implementation methodology submitted by the Contractor and shall convey its comments to the Contractor within a period of 07 (seven) days stating the modifications, if any, required thereto.
- 31.3.4 The Authority's Engineer shall review the monthly progress report furnished by the Contractor and send its comments thereon to the Authority and the Contractor within 7 (seven) days of receipt of such report.
- 31.3.5 The Authority's Engineer shall inspect the installation Works and shall submit a monthly Inspection Report bringing out the results of inspections and the remedial action taken by the Contractor in respect of Defects or deficiencies. In particular, the Authority's Engineer shall include in its Inspection Report, the compliance / recommendations for the Safety and security provisions.
- 31.3.6 For determining that the Works conform to Specifications and Standards, the Authority's Engineer shall require the Contractor to carry out, or cause to be carried out, tests at such time and frequency and in such manner as specified in the Agreement and in accordance with Good Industry Practice for quality assurance.
- 31.3.7 The Authority's Engineer may instruct the Contractor to execute any work which is urgently required for the safety and security of the Project.
- 31.3.8 In the event that the Contractor fails to achieve any of the Project Implementation Milestones, the Authority's Engineer shall undertake a review of the progress of work and identify potential delays, if any. If the Authority's Engineer shall determine that completion of the work at any location is not feasible within the time specified in the Agreement, it shall require the Contractor to indicate within 15 (fifteen) days the steps proposed to be taken to expedite progress, and the period within which the Project Completion Date shall be achieved. Upon receipt of a report from the Contractor, the Authority's Engineer shall review the same and send its comments and reasoning including applicability of penal provisions (if any) to the Authority and the Contractor forthwith.
- 31.3.9 Authority's Engineer may recommend to the Authority suspension of the whole or part of the Works if the work threatens the safety of the road users and pedestrians. After the Contractor has carried out remedial measure, the Authority's Engineer shall inspect such remedial measures forthwith and make a report to the Authority recommending whether or not the suspension hereunder may be revoked.
- 31.3.10 In the event that the Contractor carries out any remedial measures to secure the safety of suspended works and Users, and requires the Authority's Engineer to inspect such works, the Authority's Engineer shall inspect the suspended works within 3 (three) days of receiving such notice, and make a report to the Authority forthwith, recommending whether or not such suspension may be revoked by the Authority.
- 31.3.11 The Authority's Engineer shall carry out, or cause to be carried out, all the Tests specified in ToR of Service Provider and issue a Completion Certificate or Provisional Certificate, as the case may be.

31.4 Operations & Maintenance Period

- 31.4.1 The Authority's Engineer shall aid and advise the Contractor in the preparation of its monthly Maintenance Programme and for this purpose carry out a joint monthly inspection with the Contractor.
- 31.4.2 The Authority's Engineer shall undertake regular inspections, at least once every month, to evaluate compliance with the Maintenance Requirements and submit a Maintenance Inspection Report to the Authority and the Contractor.
- 31.4.3 The Authority's Engineer shall specify the tests, if any, that the Contractor shall carry out, or cause to be carried out, for the purpose of determining that the Project is in conformity with the O&M Requirements prescribed in ToR of Service Provider. It shall monitor and review

the results of such tests and the remedial measures, if any, taken by the Contractor in this behalf.

- 31.4.4 In respect of any defect or deficiency, the Authority's Engineer shall, in conformity with Good Industry Practice, specify the permissible limit of deviation or deterioration with reference to the Specifications and Standards and shall also specify the time limit for repair or rectification of any deviation or deterioration beyond the permissible limit.
- 31.4.5 The Authority's Engineer shall examine the request of the Contractor for closure of any lane(s) of the Project Highway for undertaking maintenance/repair thereof, and shall grant permission with such modifications, as it may deem necessary, within 5 (five) days of receiving a request from the Contractor. Upon expiry of the permitted period of closure, the Authority's Engineer shall monitor the reopening of such lane(s), and in case of delay, determine the Damages payable by the Contractor to the Authority.

31.5 Determination of costs and time

- 31.5.1 The Authority's Engineer shall determine the costs, and/or their reasonableness, that are required to be determined by it under the Agreement.
- 31.5.2 The Authority's Engineer shall determine the period of Time Extension that is required to be determined by it under the Agreement.
- 31.5.3 The Authority's Engineer shall consult each Party in every case of determination in accordance with the provisions of Clause 30.5.

31.6 Payments

- 31.6.1 The Authority's Engineer shall withhold payments for the affected works which the Contractor fails to meet SLA and/or rectify defaults in services.
- 31.6.2 Authority's Engineer shall within 10 (ten) days of receipt of the invoice from the Contractor, determine the amount due to the Contractor based on the work completed and/ or service delivered, after adjusting all applicable penalties, LD, etc.

31.7 Other duties and functions

The Authority's Engineer shall perform all other duties and functions as specified in the Agreement.

31.8 Miscellaneous

- 31.8.1 A copy of all communications, comments, instructions, Drawings or Documents sent by the Authority's Engineer to the Contractor pursuant to this ToR, and a copy of all the test results with comments of the Authority's Engineer thereon, shall be furnished by the Authority's Engineer to the Authority forthwith.
- 31.8.2 The Authority's Engineer shall retain at least one copy each of all Drawings and Documents received by it, including final Solution Design, System Architecture, Network Details, 'as-built' Drawings, and keep them in its safe custody.
- 31.8.3 Within 90 (ninety) days of the Project Completion Date, the Authority's Engineer shall obtain a complete set of all final documentation as prescribed in the ToR of the Service Provider, in 2 (two) hard copies and in softcopy or in such other medium as may be acceptable to the Authority, reflecting the Project as actually designed, engineered and commissioned, including an as-built survey illustrating the layout of the each Project location, and shall hand them over to the Authority against receipt thereof.
- 31.8.4 The Authority's Engineer, if called upon by the Authority or the Contractor or both, shall mediate and assist the Parties in arriving at an amicable settlement of any Dispute between the Parties.
- 31.8.5 The Authority's Engineer shall inform the Authority and the Contractor of any event of Contractor's Default within one week of its occurrence.

TERMS OF REFERENCE (ToR)

(To insert contents of Part II i.e. ToR prescribed under RFP Document)



ANNUITY PAYMENT SCHEDULE

S. No.	Annuity Payment Date	Annuity Amount (Rs.)
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
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18.		
19.		
20.		

Note: The aforementioned amount of Annuity may vary in accordance with the terms and conditions specified in the Contract Agreement and authentication of the same by the Authority's Engineer.